UNIVERSITY OF CAPE TOWN


# Aerotropoli Agriculture: A Study of the Dube AgriZone at the Dube TradePort, KwaZulu-Natal

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## ABSTRACT

The Dube AgriZone has been described as an agricultural cluster development zone situated at an air logistics platform called the Dube TradePort in La Mercy, KwaZulu-Natal. The Dube AgriZone was launched in 2012 and aims to stimulate the growth of KwaZulu-Natal"s perishable goods sector by producing high-value fresh produce all-year round in high quantities for both domestic and international markets. The main objective of this study was to investigate the current performance status of the Dube AgriZone"s operation. This research made use of data collected from key informant interviews, document analysis and observational recordings during site visits. The information was used to compile a case study of the Dube AgriZone as an example of agriculture at an airport precinct (aerotropoli agriculture).

Findings of this research have shown that the Dube AgriZone has operated with some success and failure during Phase 1. Infrastructural, logistics, financial, market, climate and administrative issues at the farming facility surfaced during this investigation. This study advocates that more research is needed on how to assist the Dube AgriZone project to operate optimally combating the current issues that it faces. It is hoped that this research can offer an interesting contribution to information on agricultural projects situated at airport precincts.

ABBREVIATIONS

| | |
|---|---|
| ACSA | Airports Company South Africa |
| ADR | Aeroporti di Roma |
| AFA | Airport Farmers Association |
| ANC | African National Congress |
| B.V. | Incorporated in The Netherlands |
| CEA | Controlled Environment Agriculture |
| CEO | Chief Executive Officer |
| CSI | Corporate Social Investment |
| DDOP | Durban Dig-Out Port |
| DIA | Durban International Airport |
| dti | Department of Trade and Industry |
| DTP | Dube TradePort |
| DTPC | Dube TradePort Corporation |
| EIA | Environmental Impact Assessment |
| eNCA | eNews Channel Africa |
| EU | European Union |
| FAWU | Food and Allied Workers Union |
| FMN | Frontier Market Network |
| FSREC | Faculty of Science Research Ethics Committee |
| GDP | Gross Domestic Product |
| ha | Hectare |
| ICAO | International Civil Aviation Organization |
| IDZ | Industrial Development Zone |
| IHSGI | IHS Global Insight |
| JIT | Just-in-time |
| JV | Joint Venture |
| km | Kilometre |
| KSIA | King Shaka International Airport |
| KSEMS | Kerry Seppings Environmental Management Specialists |
| Kwanalu | KwaZulu-Natal Agricultural Union |
| KZN | KwaZulu-Natal |
| KZNDEDT | KwaZulu-Natal Department of Economic Development and Tourism |
| KZNDTPCA | KwaZulu-Natal Dube TradePort Corporation Act |
| LMJV | La Mercy Joint Venture |
| MEC | Member of the Executive Council |
| n.p. | No Page |
| NCOP | National Council of Provinces |
| PPP | Public-Private Partnership |
| SASRI | South African Sugarcane Research Institute |
| SDCEA | South Durban Community Environmental Alliance |
| SESSA | Sustainable Energy Society of Southern Africa |
| SEZ | Special Economic Zone |
| SOC | State-owned Company |

| | |
|---|---|
| TGL | Tongaat Group Limited |
| THD | Tongaat Hulett Developments |
| THG | Tongaat Hulett Group |
| UCT | University of Cape Town |
| USA | United States of America |
| VBA | Verenigde Bloemenveiling Aalsmeer |
| VCE | Virtual Consulting Engineers |
| WFS | Worldwide Flight Services |

TABLE OF CONTENTS

LIST OF FIGURES AND MAPS

LIST OF TABLES

CHAPTER 1: Introduction

This thesis is a case study of the Dube AgriZone. It is an agricultural facility situated at what is described as an air logistics platform in La Mercy, KwaZulu-Natal (KZN) called the Dube TradePort (DTP). Dube AgriZone was launched in March 2012 aimed at stimulating the growth of KZN‟s perishable goods sector by means of the facility continuously generating high-value fresh produce in high quantities for both domestic and international markets. Dube AgriZone is a component of the DTP public investment.

The Dube AgriZone is an agricultural project and farming facility that is in its infancy. This study came across minimal research conducted on the site and the likes of agricultural activity at airport precincts. Therefore, the purpose of this study was to uncover, produce and expose information on the agricultural platform, raising awareness about the project. The Dube AgriZone was identified as an example of what this research termed as „aerotropoli agriculture‟ because it is a site where agriculture takes place within an airport precinct. As shown by this study‟s literature review, this under-researched and rare topic could be characteristic of a unique phenomenon, and research dedicated toward it could uncover valuable information on this precedent form of aerotropoli agriculture for future applications.

The concerns of this research are reflected within the study‟s main research questions:

- What features characterize the framework of the Dube AgriZone‟s Phases, and what are the motives behind the project‟s design?
- What has been the operational performance of the Dube AgriZone thus far?

The objectives of this research were to:

- Reveal the insights behind the DTP‟s establishment and airport agricultural activity for the region.
- Identify the details constituting the framework of the Dube AgriZone‟s Phases and to determine the motives behind them.
- Investigate the Dube AgriZone‟s performance in terms of how it has been administered and operated as a project thus far.

The significance of this study is rooted in the fact that research on the Dube AgriZone and aerotropoli agriculture is rare. Research findings from this study could potentially fill the gap on this phenomenon that is evident in practice but not in theory. As the Dube AgriZone is relatively new, this research could offer an early assessment into the operation which could be beneficial for its future and that of other aerotropoli agriculture project ventures.

This thesis is organized into seven chapters. Chapter Two provides the contextual and theoretical background of this study. Literature on aerotropoli and agriculture at airports have been reviewed to provide a framework with which aerotropoli agriculture could be associated. The third Chapter presents the background of the Dube AgriZone and the DTP as well as a brief history into the airport-city‟s development. Chapter Four contains the methodology explaining the process of primary and secondary data collection and analysis for this study. The fifth Chapter presents the findings of this research whilst the sixth Chapter reflects on those findings. Finally, the last Chapter concludes the study providing an overall critique and interpretation of the research.

# CHAPTER 2: Literature Review

## 2. 1. Introduction

This chapter presents the contextual and theoretical frameworks of this research topic. The overarching context of this study is concerned with agriculture at airport precincts, which this study has termed as „aerotropoli agriculture". The contextual framework reviews the literature on aerotropoli, airport agriculture and environments, and aerotropoli agriculture. The theoretical framework presents some of the major debates and theories associated with airports and agriculture that relate to this research topic.

## 2. 2. Contextual Background and Research Framework

### 2. 2. 1. Aerotropoli

*Defining the Aerotropolis*

The aerotropolis[1] has been defined as a newly emergent urban entity that forms at airport environs. The term aerotropolis was coined to describe how airport vicinities have developed into metropolitan regions by incorporating and concentrating both aviation-linked and aviation-dependent businesses, and multimodal transportation services (Kasarda, 2006a; Kasarda, 2011). It has been regarded as the worldwide phenomenon shaping urban development and business location in the 21st century (Kasarda, 2008; Wang *et al*., 2011).

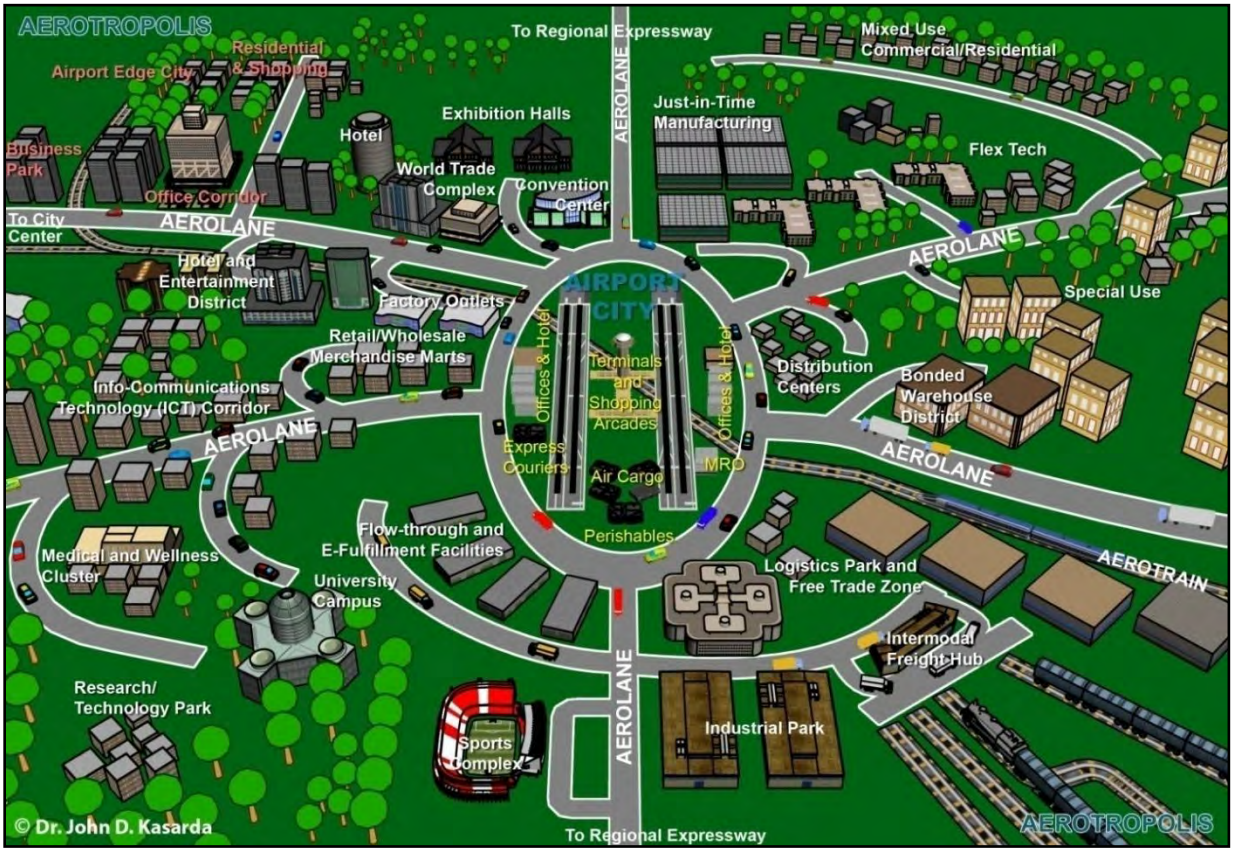
Freestone (2009) concurs with Kasarda (2001; 2006a) that airports represent the fourth wave of urban development and business concentration during the 21st century, succeeding highways as the third during the 20th, railroads as the second during the 19th, and seaports as the first during the 18th century.

[1] „Aerotropolis"– singular. „Aerotropoli"– plural.

*The Aerotropolis: Configuration and Representation*

The aerotropolis district has been characterized as analogous in form and function to a conventional urban metropolis consistent of a centralized airport city, and an outlying region (radiating up to 30 kilometres [km] from the airport city core) comprising of aviation-oriented business enterprises and mixed-use residential developments that form the greater aerotropolis (Kasarda, n.d.; Kasarda, 2008). The core region of the aerotropolis, the airport-city, is where the airport passenger terminal is situated. Commercial and recreational facilities[2] develop adjacent to the terminal creating the city-like environment and commercial nexus. The aerotropolis region surrounding the airport city incorporates a variety of facilities and services that are seen in Figure 1 below (Kasarda, 2006b).

Figure 1: Aerotropolis Schematic by Dr. John Kasarda




*Source: Kasarda (n.d.)*

[2] Offices and business support services; convention and exhibition centres; airline lounges; logistics and distribution facilities; hotels; and restaurants, retail and recreational services (Kasarda, 2006b).

Kasarda (2008) believes that aerotropoli represents 21st century airport transformation whereby airports are driving business location and urban development, adopting formerly non-associated commercial and residential functions enabling city formation around the airport. Freestone (2009) regards the aerotropolis model as an economic development strategy that increases a city‟s competitive advantage in the global market. Competitive advantage, Kasarda (2001) states, is a function of the law, „survival of the fastest‟, which advocates speed and agility as factors of commercial success offering just-in-time (JIT) delivery of products and services. Charles *et al*. (2007) likens Kasarda‟s interpretation to an intelligent transportation node capable of accessing new and distant global markets. Influenced by Kasarda‟s work, Lindsay (2006: n.p.) quotes that: "[t]he aerotropolis represents the logic of globalization made flesh in the form of cities".

*Evolution of the Aerotropolis Concept*

Freestone (2009) describes the work of Le Corbusier in the 1920s as the earliest conceptualization of airport-centred cities: the portrayal of a city featuring an aerodrome with a multimodal central station surrounded by high-rise developments. Freestone (2009) and Wang *et al*. (2011) quote Conway‟s (1980) conceptualization of the „Jet City‟ consisting of office and industrial parks, cargo and distribution centres, and travel accommodation facilities. It was during the year 2000, that American academic, Dr. John Kasarda, revived the airport-centric development idea for the 21st century and labelled it as the aerotropolis. Kasarda‟s work is commonly referenced in the modern discourse of aerotropoli.

According to Kasarda (2006a), aerotropoli entities emerged because of the advantages that airports provided to business in the globally networked economy. Reasons why airport cities have evolved have been attributed to four basic factors:

1. "Airports need to create new non-aeronautical revenue sources, both to compete and to better serve their traditional aviation functions;
2. The commercial sector‟s pursuit of affordable, accessible land;
3. Increased passengers and cargo traffic generated by gateway airports, and;
4. Airports serving as a catalyst and magnet for landside business development" (Kasarda, 2006b: 9-10).

An additional driver is what Kasarda (2011) terms as the „must have it now" consumer age, whereby consumerism has become time-constrained by product longevity and consumer impatience of product delivery. Kasarda (2001) identifies global economies shifting toward higher value products (eg. perishables and electronics) and creating new supply chain processes that demand fast and flexible trade.

*Aerotropoli: Contesting Discourses*

One of the most contested subject matters in aerotropoli discourses is the sustainability of the aerotropolis model. Kasarda (n.d.) is certain that aerotropoli development and sustainable development are complimentary. Kasarda (2006b; 2008) believes that aerotropoli development can be positive in collaborative airport, urban and business-site planning enabling economic efficiency, and environmental and social sustainability. The only challenging aspect that Kasarda (2008) associates with aerotropoli development is how to design it such that it can generate greater returns to the airport and its users, businesses, and the country it represents.

Charles *et al*. (2007) and Freestone (2009) are, however, sceptical of the sustainability of aerotropoli development. Air and noise pollution have been highlighted as unavoidable environmental impacts of aerotropoli developments (Freestone, 2009). Charles *et al*. (2007) are critical of the reliance aerotropoli have upon oil, an unsustainable fuel source fuelling an unsustainable mode of transportation. Aerotropoli have also been criticized economically for their reliance on massive financial investments and whether it is truly representative of a sustainable economic development strategy (Freestone, 2009).

Kasarda (2006b) is convinced that aerotropoli developments are advantageous to both businesses (providing them with rapid access to global suppliers and consumers) and communities (providing them with employment opportunities which Kasarda believes are generated faster within an aerotropolis than compared to a metropolis not centred around an airport). However, Freestone (2009) warns that most air commerce deals with cargo handled within warehouses and distribution facilities. Although these facilities may offer jobs, automation limits job growth and the jobs available are often low-paying.

With regards to regional prospects of aerotropoli, Lindsay (2006:n.p.) states that: “the imposition of an aerotropolis may be one of the only remaining ways some developing countries can restore order to their collapsing urban grids”. However, Self (2011) cautions against aerotropoli development as portraying a „utopian guise‟ with Kasarda as the persuasive advocate luring politicians and urban planners to expand their airport infrastructure in satisfying the neoliberal vision that air commerce is the latest means to exploit new markets with high-end goods set to fuel global economic growth.

*Aerotropoli Developments*

The literature cites 84 aerotropoli and airport cities around the world that are either operational or continually developing (Fig. 2). The world‟s largest aerotropolis is said to be Dubai World Central, but Amsterdam Airport Schiphol has been referenced as the leader in airport-centric development since the 1930‟s (Lindsay, 2006; Freestone, 2009). Although the majority of aerotropoli and airport cities are currently found in North America, China will host the majority in future as it intends to build 100 new mega-project airports by 2020 (O‟Toole, 2011).

Within the African continent there are few aerotropoli developments. There are plans to develop an aerotropolis in Cairo, Egypt, but endemic political instability has postponed it. The African country with the most projected aerotropoli developments is Nigeria which intends to establish four aerotropoli at Kano, Abuja, Port Harcourt and Lagos. It has been reported that: “[t]he country is ideally situated to facilitate freight and air passenger traffic to other parts of the African continent, and beyond to Europe and Asia” (FMN [Frontier Market Network], 2012:5).

Africa has two emergent aerotropoli developments that are both situated in South Africa, namely the Ekurhuleni O. R. Tambo Aerotropolis in the Gauteng Province, and Aerotropolis:KZN (home to the DTP) situated in the KZN Province.

Figure 2: Worldwide Locations of Developing and Operational Airport Cities and Aerotropoli


*Source: Kasarda (n.d.)*

### 2. 2. 2. Airport Agriculture and Environments

*Airport Agriculture*

Airport Agriculture is a topic that rarely features in research databases. This literature deficient topic is one that appears to be dominated by North American research. In their study on agricultural airports in Texas, Borowiec and Dresser (2000) describe agricultural airports as ones that serve regions where intense agricultural production activity takes place amongst communities whose economies are mainly based and reliant upon agriculture. Agricultural airports are also recognized as: "a special subset of general aviation airports" (Borowiec & Dresser, 2000: xiii). In the United States of America (USA), agricultural airports are functionally categorized if the airport premises are used for agricultural purposes and agricultural-related activity 60% of the time. Sterner *et al.* (1984) universalizes the concept of airport agriculture by describing designated portions of airport land used for agricultural activity not just in the USA, but in other countries as well.

*Advantages and Disadvantages of Airport Agriculture*

According to Blackwell *et al*. (2009) the „principle land cover" occupying most airport territories has been grass. Airport grasslands are considered maintenance nuisances placing a constant financial burden on airport authorities to manage the grass (DeVault *et al*., 2013). As a constructive financial alternative, airport authorities have leased portions of airport land for agricultural activities (Schmidt & Seamans, 2013). Agricultural activity has been promoted in replacement of airport grasslands in order to minimize maintenance duties thereby eliminating the economic burden and enabling revenue generation (Blackwell *et al*., 2009; Schmidt & Seamans, 2013).

However, Blackwell *et al*. (2009) argues that there are hazards associated with agriculture at airports. The most referenced hazard of airport agriculture is the risk associated with wildlife attractions– particularly birds. According to the International Civil Aviation Organization (ICAO)[3]: "[l]and uses considered as contributing to wildlife hazards on or near (i.e., within 13

[3] The ICAO is an authority providing the acceptable worldwide regulatory standards for civil aviation industries.

km) airports are fish processing operations; agriculture; livestock feed lots; refuse dumps and landfills; factory roofs; parking lots; theatres and food outlets; wildlife refuges; artificial and natural lakes; golf and polo courses, etc.; animal farms; and slaughter houses" (Schmidt & Seamans, 2013:118). Blackwell *et al*. (2009) add that landscaping, roosting habitats, wetlands, water retention ponds, and undeveloped natural areas also provide sites for further wildlife attraction near airports.

Sterner *et al*. (1984) comments that birds and insects are attracted to crops for foraging, which can damage airport agricultural crops. The literature exposes agriculture at airports as an air-traffic safety hazard related to aircraft engine bird-strikes. Blackwell *et al.* (2009) are concerned about bird habitats near the airstrip zones because the approach and departure altitudes of aircrafts feature in the same altitudinal vicinity of bird flight paths. Aircraft collisions with birds can lead to financial costs to civil aviation industries from aircraft damage, but most significantly, it can lead to loss of human lives.

*Reservations and Recommendations on Airport Agriculture*

Research into airport agriculture has been criticized. DeVault *et al*. (2013:12) references an editorial of Embry-Riddle Aeronautical University that stated: "Why spend tax money researching airports as agriculture sites... have they never heard of risk?". Blackwell *et al*. (2009) seems to be on the fence in encouraging authorities to refrain from using airport premises for agricultural purposes, unless the airport has no other financial alternative to ensure its economic viability. Conversely, Schmidt and Seamans (2013) are in favour of certain agriculture at airports. The authors suggest that crops which are unpalatable to wildlife should be invested in so as to reduce the attraction to birds whilst still generating revenue.

Recommendations have been provided regarding how to lessen the impact that agricultural activity may have on airport industries and their environments. Although in conflict with the ICAO protocol, research by Sterner *et al*. (1984) supports that enclosed livestock and fur farming poses no threat to aviation activity and is suitable within a 2 mile (3, 2 km) radius of the airport centre. Schmidt and Seamans (2013) believe that airport habitat management should move toward creating agricultural environments that are unattractive to hazardous birds and other

wildlife but can generate revenue. Although DeVault *et al*. (2013:10) stress that "[a]viation safety should not be compromised because of other interests at the airport, including agricultural production for economic gain", Blackwell *et al*. (2009) suggest that it would be suitable provided that agricultural activity is a distance of 8 km from the farthest edge of the airport operational zone.

### 2. 2. 3. Aerotropoli Agriculture

This literature review search came across very few and vague references of agriculture at airport precincts. Although never explicitly stated as an example of aerotropoli agriculture, Kasarda and Lindsay‟s (2011) description of the „Verenigde Bloemenveiling Aalsmeer‟[4] (VBA) as the largest horticultural marketplace and auction centre in the world located in Aalsmeer, The Netherlands, comes close. The VBA is situated 6 miles (9, 7 km) from Amsterdam‟s Schiphol International Airport. Its close proximity to the airport was never deliberately planned. Air transportation access and improvements in technology (refrigeration and greenhouses) have created a $40-billion flower industry for The Netherlands, now a global leader in horticulture.

The only other identifiable reference to an example of aerotropoli agriculture is what Kasarda and Lindsay (2011:222) name: "the world‟s first custom-built floricultural aerotropolis". The authors refer to a new airport that opened during 2010 outside the capital city of Quito, Ecuador. However, the authors do not mention the name of the new airport or where exactly outside of Quito it is situated. Whilst the chapter by Kasarda and Lindsay (2011) indicates the presence of the aerotropolis outside of Quito, it is mysteriously absent on Kasarda‟s graphic of developing and operational airport cities and aerotropoli around the world (See Fig. 2).

With regards to the aerotropolis schematic in Figure 1, the illustration does indicate a perishables zone within the airport-city core region of the aerotropolis. However, the aerotropoli literature does not specify whether it could be an academic reference to aerotropoli agriculture (Kasarda, 2001; 2006a; 2006b; 2008; 2011).

[4] „Verenigde Bloemenveiling Aalsmeer‟ translates into United Flower Auctions, Aalsmeer.

The case study site of this research, the Dube AgriZone, appears to be the only agricultural facility situated at what is described as an airport-city district (the DTP) within an aerotropolis (Aerotropolis:KZN) (see Chapter 3). The literature has not revealed any concrete examples or research on aerotropoli agriculture, which might indicate that aerotropoli agriculture may be a phenomenon that exists in practise (as seen at the Dube AgriZone) but not in theory, signifying a gap in the research. Although this contextual review may not have yielded any worthy literature on agriculture at airport precincts, perhaps the lack of it has revealed aerotropoli agriculture as somewhat of a neologism.

## 2. 3. Theoretical Framework

### 2. 3. 1. Airports

#### 2. 3. 1. 1. Airport Governance and Regulation

An apparent trend has been recognized in the way in which airports have been governed and regulated. Gillen (2011) states that previously, airports were understood as public utilities owned by government agencies and managed in alignment with State policy. Recent trends demonstrate that airports are now modifying their operational units and management protocols adopting commercially administrative schemes (Kasarda, 2006b & 2008; Gillen, 2011). According to Doganis (1992, quoted by Freestone 2009:163): "[a] macro-trend affecting the nature of airports in their urban context has been the progressive loosening of their historic ties with the state. Airports have shifted from being a branch of government to dynamic and commercially-oriented businesses".

This transition has been attributed to three economic trends: commercialization, privatization and globalization (Freestone, 2009). According to Gillen (2011), the deregulation of some airline operators in developed countries had shown improvements in productivity, innovation and profitability which have lead to the reassessment of airports managed by governments. Kasarda (2006b:17) adds that "[t]he move to a corporate organizational form in airport-city management promises to reduce the role of politics, lessen bureaucracy, and increase operational efficiency".

Although publically owned and administered airports were assumed to be the only way to maintain airfare prices at a minimum, the commercialization of airports has now been accepted as capable of yielding better results of reduced airfare, enhanced service quality, and rapid facility improvements through the principle of competitiveness (Gillen, 2011).

What remains debatable is whether airport governance and regulation is best suited towards maintaining a public or private administration. Whereas some authors advocate that privately owned and managed airports are the most cost- and operationally-efficient, others suggest that homogenously characterized regulation (public or private, but not a partnership of both) enable the same outcome because of less conflicting objectives (Gillen, 2011).

2. 3. 1. 2. Integrating Aeronautical and Non-aeronautical Activities

According to Gillen (2011), airports were traditionally public utilities primarily used by people who only intended to depart on an airline flight for travelling purposes. The main source of airport revenue was thus reaped from one functional aspect– the use of airlines. Airport authorities did not presume that passengers could generate an additional source of revenue other than from flying, until the transition of airport management was seen from public to private sectors, and from when airport amenities evolved into airport cities (Gillen, 2011).

Appold and Kasarda (2011:91) state that: "[a]irports are evolving from simple infrastructure providers to complex multiproduct, multiservice enterprises". The concept of a multi-sided airport platform is one that divides airport market activity into two components: aeronautical and non-aeronautical services (Gillen, 2011). Morrison (2009) and Kratzsch and Sieg (2011) believe that non-aeronautical business activity has grown at airport developments around the world over the past two decades because of the perceived advantages that they offer. Non-aeronautical services have been promoted in generating additional revenue at airports, and enabling the cross-subsidization of the aeronautical service component at airport developments (Appold & Kasarda, 2011). In this case, aeronautical service charges can be decreased so as to encourage more flights which in turn attract more passengers to the airport, and increases the presence of potential consumers to exploit the non-aeronautical services (Kratzsch & Sieg, 2011). This raises the

belief amongst some authors that an airport development can recover higher returns by investing in non-aeronautical activities (Freestone, 2009; Appold & Kasarda, 2011).

Morrison (2009:114), however, is sceptical toward promoting non-aeronautical activities at airport developments: “airport security could be adversely affected by the development of non-aeronautical businesses, particularly if such businesses are located at or near passenger terminals on the groundside”. The author believes that non-aeronautical business activities of airports can have differing impacts on aeronautical components depending on the governance structure of an airport. Gillen (2011) has identified different governance structures of an airport as:

- Government-owned (either publically or privately operated);
- Public-private Partnerships;
- Fully private for-profit;
- Partially private for profit (either with private controlling interest, or with government controlling interest), and;
- Independent not-for-profit corporations.

These multiple airport governance structures lead Morrison (2009) to believe that non-aeronautical investments cannot be expected to reap equivalent outcomes due to the complexity of the governance structures which the author believes has been misinterpreted.

### 2. 3. 2. Agriculture

#### 2. 3. 2. 1. The State of Agriculture in Africa: Trends and Concerns

Projections are that by 2050 the world‟s population will increase to 9-billion with the global food demand subsequently anticipated to increase (Bourne, 2009; Thurow, 2010). Currently, an estimated 840-million people living worldwide do not have enough food and are malnourished, and Africa is home to the greatest percentage of malnourished individuals. According to Clover (2003), the African continent has shown minimal progress in reducing the rate of undernourishment in the last 30 years. de Janvry and Sadoulet (2010) are convinced that the state of agriculture in Africa is in a severe crisis. Cohen (2005) adds that the continent‟s agricultural sector is under pressure due to increasing rates of population and urbanization. By 2030, Africa

is anticipated to have 1,489-billion people of which 70% of its population growth will take place within urban centres. de Janvry and Sadoulet‟s (2010) theory of African urbanization is that a lack of sufficient agricultural growth, investment and employment opportunities in rural regions has resulted in people migrating to urban centres– further impacting the sector by decreasing the available labour force. However, Binswanger and Townsend (2000) believe that the continent contains immense agricultural potential.

Africa is supposedly home to more than half of the world‟s unused arable land[5] and according to Thurow (2010:103): "boosting agricultural yields in Africa could be a major step toward feeding not just the continent but also the rest of the world". Bourne (2009) suggests that the world needs a second Green Revolution to take place in Africa, but de Janvry and Sadoulet (2010) caution that it would need to be different than the first ensuring that the agenda incorporates a holistic vision on the preferred type of agrarian establishment.

According to Binswanger and Townsend (2000), growth of the African agricultural sector will not occur if its producers are limited to domestic markets and would need to rely on international export markets as well. Referring to a 1997 World Bank Report, the authors contend that: "countries need markets to grow, but they need capable institutions to grow markets" (Binswanger & Townsend, 2000:1082). In this regard, de Janvry and Sadoulet (2010) observe that business and investment in African agriculture is difficult to initiate due to incomplete development of institutions, a lack of infrastructure, unreliable governance, and widespread corruption.

Some of the major limiting factors against Binswanger and Townsend‟s (2000) suggestion for African agricultural exports are the tariff barriers to agricultural-export trade, concerns over outsourcing of produce needed locally, and the associated food-miles from food exports (MacGregor & Vorley, 2006; Clover, 2003; Kasarda & Lindsay, 2011). The food-miles concept encompasses the idea to purchase goods that have travelled over less distance (from farm to supermarket shelf) and to avoid purchasing goods that have travelled over great distances (especially by air-freight) (MacGregor & Vorley, 2006).

[5] According to Binswanger and Townsend (2000), the African regions with the strongest agricultural resource bases are Angola, Central African Republic, Democratic Republic of Congo, Republic of Congo, Gabon, Guinea-Bissau, Liberia, Sierra Leone, and Sudan.

Different arguments on food miles have surfaced in line with the latest trend that some African farmers have switched from growing staple crops to growing high-value agricultural produce mainly for international export (MacGregor & Vorley, 2006; de Janvry & Sadoulet, 2010). On the one hand, the purchase of foreign high-value air-freighted produce is considered unsustainable amongst international consumers, particularly if grown with higher input and energy costs (eg. characteristic of greenhouse farming). Long-distance travelled goods are associated with higher rates of carbon-based emissions making it one of the culprit forces driving climate change in which the African continent is anticipated to be the most vulnerable toward (Challinor *et al*., 2007). On the other hand, the purchase of foreign high-value air-freighted produce is considered supportive of poverty reduction and development of emergent African markets.

An adverse investment in African agriculture known as „land-grabbing" has surfaced. Some foreign countries have acquired agricultural land in Africa to secure food production and resources for their own country"s use and benefit (Cotula & Vermeulen, 2009). Some Asian and Middle Eastern countries have invested in agricultural land in countries like Mali, Senegal, Sudan, Ethiopia, Zambia, Gabon and Madagascar to grow the likes of staple crops, timber, palm oil and plantations for biofuel. The „farms race" has sparked debate over issues of African environmental sovereignty, annexing and outsourcing of natural resources, regional food security, and potential for regional instability and war (Cotula & Vermeulen, 2009; De Schutter, 2011; Sumberg *et al*., 2012). However, Cotula and Vermeulen (2009) state that there is insufficient evidence to support whether these large-scale investments have an overall positive or negative impact on the current and future state of agriculture in Africa.

2. 3. 2. 2. Emergent Agricultural Techniques

It is predicted that additional farmland the size of Brazil is required to feed the anticipated 9-billion people that will occupy the world by 2050 (Despommier, 2011). However, according to Despommier (2011), that amount of land is not available at present, nor will it be in future, and is thus problematic. Projections of a world with an erratic and changing climate, increasing population, rapidly expanding urban centres, and diminishing agriculturally-productive land have been raised as factors of concern for the future of the agricultural and food production sectors.

Some advances have been made toward agricultural and food production for the future. Controlled environment agriculture (CEA), a specialized form of agriculture, has been referred to as the solution. CEA is enclosed from the external environment and is conducted within tunnel or greenhouse structures (Wittwer & Castilla, 1995). It takes place indoors applying the most common techniques of hydroponics[6] or aeroponics[7] farming. According to Despommier (2011), CEA is the most effective agricultural practice for the future.

Advancements in CEA include what Germer *et al*. (2011) term as „skyfarming" and what Despommier (2011) terms as „vertical farming". Germer *et al*. (2011) describe skyfarming as a form of CEA that takes place within purpose-built multi-storey buildings. Skyfarming methods and design of the CEA system is determined by the plant to be grown. According to Germer *et al*. (2011), the selection of suitable plant varieties and the development of an appropriate growing environment in CEA must occur in tandem. Despommier (2011) has been an avid advocate of vertical farming and key researcher in the field. Despommier (2011) believes that greenhouses should be constructed as high-rise buildings within urban centres creating indoor vertical farms.

Many benefits are associated with CEA, and its forms of skyfarming or vertical farming. Indoor food cultivation allows repairing and restoration of farmland to its original ecological state, enabling ecosystem services to function in stabilizing the climate imbalance (Despommier, 2013). CEA can be developed anywhere in the world because they do not depend on soil and are immune to the local climate (Despommier, 2013). Being enclosed protects the crops from severe weather-induced elements such as frost, wind damage, floods, droughts and storms (Wittwer & Castilla, 1995). CEA can capture alternative energies (wind, solar, geothermal and tidal) to heat and cool the enclosed structures with engineered infrastructure, and its methods of farming allow all-year round production of plants with higher outputs yields by maximizing on production surface areas of the vertical structure (Despommier, 2011). CEA's enclosed environment prevents damage and disease of crops by birds, insects and other predators, thus eliminating the use of pesticides and other toxic substances to protect the plants (Wittwer & Castilla, 1995;

[6] Hydroponics farming involves a specialized method of growing produce in the absence of soil within an aqueous solution containing nutrients that are provided to the plant generally conducted under protection of a greenhouse (Wittwer & Castilla, 1995).

[7] Aeroponics farming is based on plant cultivation in the absence of soil or a substratum (aqueous solution) placed in containers filled with plant nutrition generally conducted within greenhouses (Ziegler, 2005).

Despommier, 2013). The socio-economic benefits of CEA include employment creation and reduction of transportation due to the fact that sky- and vertical-farms can be located closest to markets where demand is high (Germer *et al*., 2011).

In comparison, few disadvantages are associated with CEA. Despommier (2013) is concerned that the price of land in urban centres would push vertical CEA operations further away from where most people are projected to live. Germer *et al*. (2011) highlight that in practice, CEA operations can still be compromised by a lack of available water and nutrients, ineffective temperature, insolation and humidity controlling mechanisms, persistent pest attraction, and unreliable energy supplies which would all induce suboptimal growing conditions within a CEA operation.

## 2. 4. Chapter Summary

This chapter has presented a review of this research‟s contextual concepts of aerotropoli, airport agriculture, and aerotropoli agriculture. The contextual review has indicated that an emergent urban entity is developing around airport amenities which are shaping business and urban developments of the 21st century. These airport-centred urban developments have been referred to as aerotropoli and they have been integral toward maintaining and enhancing a globally networked economy. Although its sustainability as a development has been debated, aerotropoli have proliferated throughout the world appearing in six of its continents and many more are soon to develop.

The literature on airport agriculture has revealed it to be an under-researched topic. Agricultural activity at an airport seemed to have its proponents and opponents, but neither one of the agendas of airport agriculture as acceptable or inacceptable dominated over the other.

Aerotropoli agriculture did not feature as an identifiable topic within existent literatures. It was identified as a phenomenon seen in practise as the focal case of this study, but was completely absent in theory indicating an apparent gap in research. In the process of finding no worthy literature on aerotropoli agriculture, it seemed to indicate the potential for the phenomenon to be identified as an emergent neologism.

Additionally, this chapter uncovered some of the major debates related to both airports and agriculture as the theoretical framework of this review. The literature showcased that some airports have undergone a transformation of both their administrative and physical components, eliminating their association with the State and converting into commercially-oriented businesses. These newly transformed airports have diversified in character incorporating aeronautical and non-aeronautical functions.

Many debates over the state of agriculture in Africa have emerged. Overall the sector is described as both cursed, (from issues of climate change; ineffective governance and policies; decreasing labour forces for agriculture) but fortunate (containing untouched arable land with immense potential for Africa to feed itself and the rest of the world). Appeals for investment in the African agricultural sector have been made, but investments to export and to allow foreign procurement of its agriculturally-productive land have made it challenging for the sector to address the continent‟s issues and meet its needs in a suitable and sustainable manner.

It appears that there will not be enough food productive land for an anticipated world of 9-billion inhabitants by 2050. The state of agriculture in some regions of the world may be in despair, but emergent farming techniques may offer a solution. CEA has surfaced as an emergent farming technique that could ensure the future production of food for a hot, hungry and crowded world, but the literature has also exposed that CEA operations are not flawless and can be compromised.

## CHAPTER 3: Dube AgriZone and Dube TradePort Background

This chapter outlines the backgrounds of the researched Dube AgriZone site and the DTP entity. A historical description of regional airport establishments in Durban is provided. In closing, the chapter presents a section that reveals how the DTP was developed.

### 3. 1. Research Site and Entity

#### 3. 1. 1. The Dube AgriZone

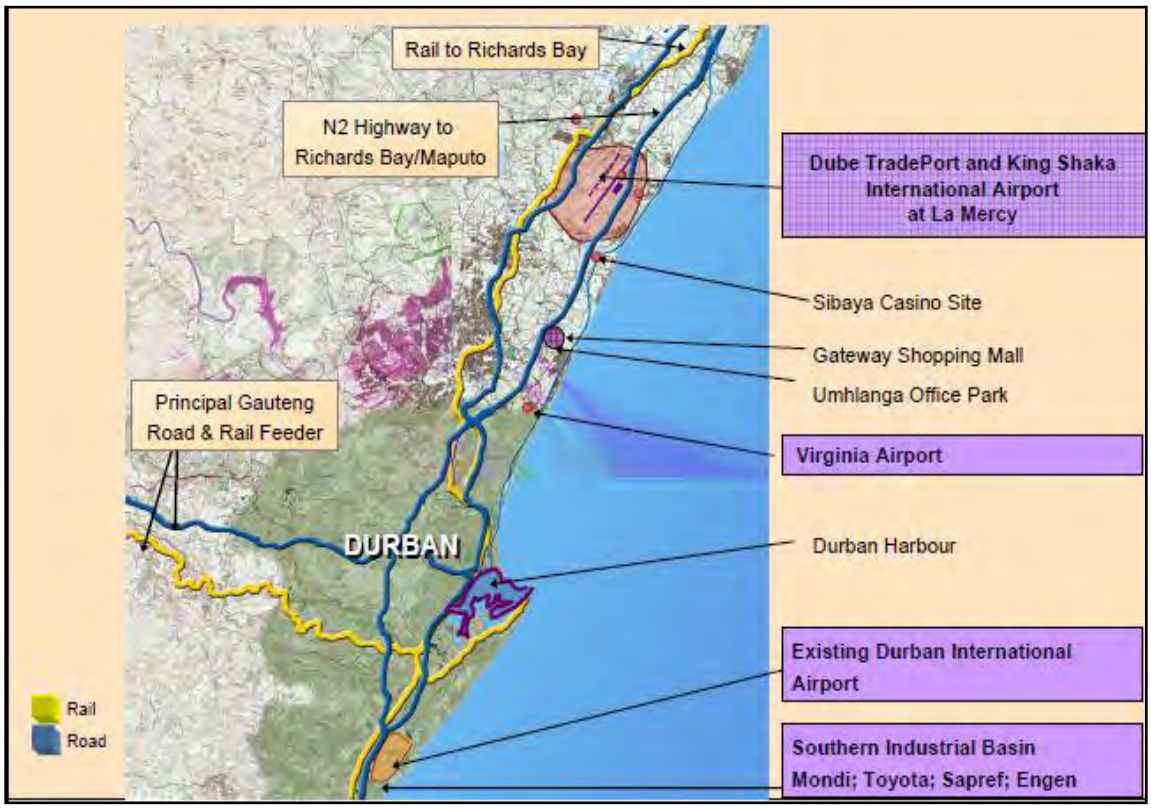
The Dube AgriZone is a R434-million agricultural facility situated at the DTP airport-precinct in La Mercy of the KZN province, South Africa (Certhon & Dube AgriZone, 2012; Fig. 3; Map 1; See Video 1[8]). Dube AgriZone is South Africa‟s first integrated perishable-goods supply chain and the largest climate-controlled glass-enclosed cultivation area in Africa. Described as an agricultural cluster[9] development zone, the Dube AgriZone is characterized as, "the most technologically advanced future farming platform on the continent" (DTP, 2014a:n.p.). It was officially launched in March 2012 by the President of the Republic of South Africa, Jacob Zuma, who commented during the opening that "[t]he focus on agriculture and food security in this airport city is a very progressive step" (The Presidency, 2012:n.p.). Thus far, the Dube AgriZone has created 618 national job opportunities during its operation phase and it aims to produce a volume of 3,750 tons of fresh produce from its farming facility by 2014 and 2015 (DTPC, 2012; KPMG, 2013).

[8] Video 1: http://www.youtube.com/watch?v=OaAouEFMPrA (DTP, 2011).
[9] „Clusters" are the geographic concentrations of interdependent enterprises and institutions that collectively provide a related service situated within a specific geographic region (Porter, 1998).

Figure 3: Aerial View of the Dube AgriZone Site Facing a Northeastern Direction

*Source: Dube AgriZone, 2013:6*

Map 1: Dube TradePort Site




*Source: AECOM-McClier 2002:27*

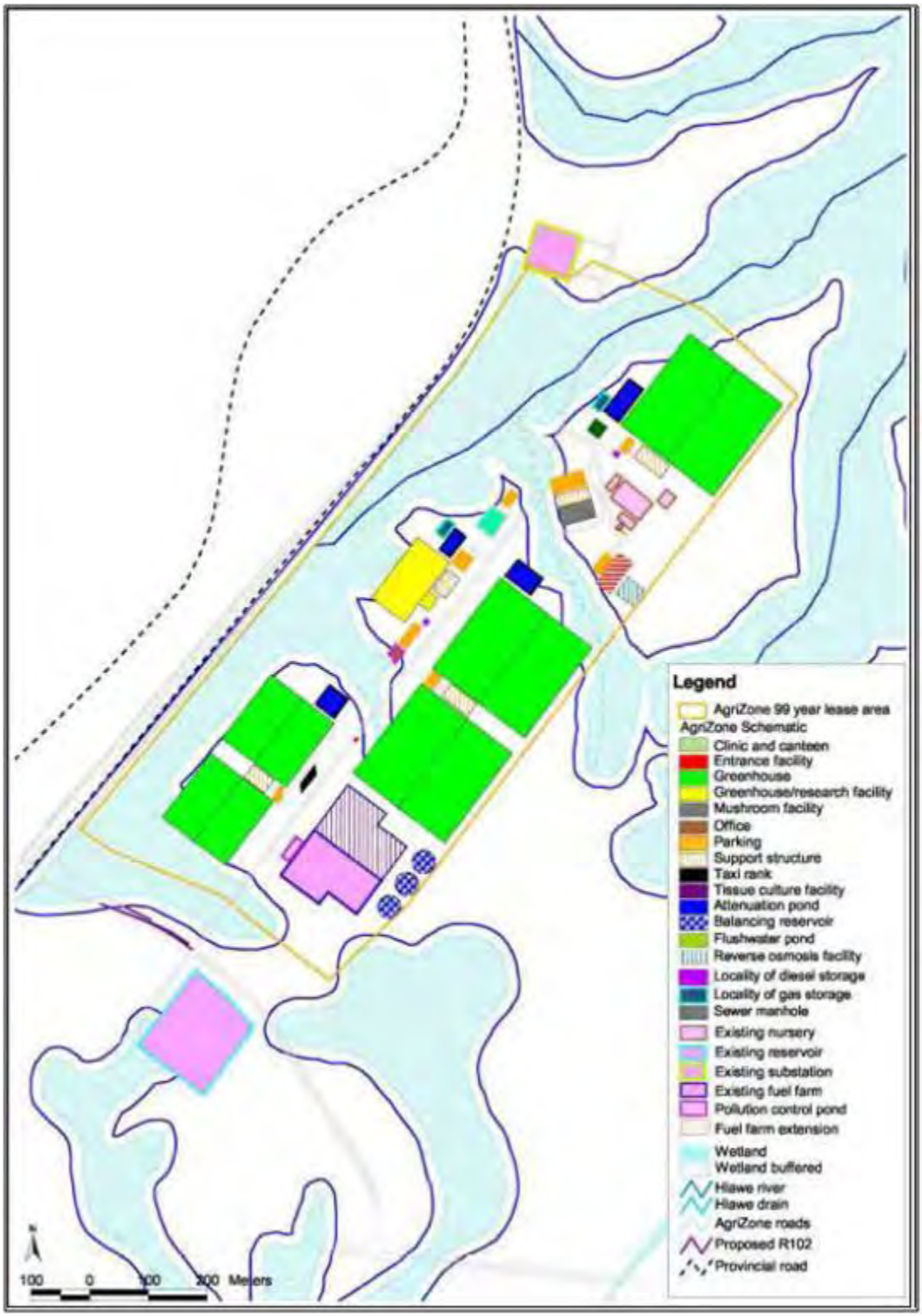
Dube AgriZone is currently a 64 hectare (ha) site situated adjacent to the King Shaka International Airport (KSIA)[10] (Fig. 4). The main physical components of the site are five greenhouses (production and growing zones), a pack-house and distribution centre (post-harvest handling facility), a tissue culture lab (Dube AgriLab), a nursery (misting tunnels, potting sheds and staging arena), and support infrastructure and services (administrative office building and municipal infrastructure) (Posthumus, 2011) (Map 2).

Figure 4: Info-graphic of Dube AgriZone adjacent to King Shaka International Airport


*Source: Dube AgriZone, 2013:6*

[10] KSIA is owned and managed by Airports Company South Africa State-owned Company (SOC) Ltd.(ACSA) who is mandated to operate the airport on a 10 year concession from its date of inception in 2010 ("Dispute ends", 2006).

Map 2: Dube AgriZone Site Map




*Source: VCE (Virtual Consulting Engineers), 2010:6*

Dube AgriZone‟s aim is to stimulate the growth of KZN‟s perishable-goods sector by creating a cluster of facilities and services in a limited growing environment that can generate high-value fresh produce all-year round with high-yield production rates for both domestic and global markets (mainly European and Middle Eastern) (DTP, 2014a). In future the Dube AgriZone is envisaged to develop into a 200 ha farming platform that may consist of glass and plastic greenhouse structures, tunnels and shade houses, aquaculture facilities, open field farming, packaging and distribution centres, and renewable energy facilities (Dube AgriZone, 2013).

The Dube AgriZone is one of the main commercial hubs of the DTP and is administered as a separate programme shown in Table 1. Different stages of development referred to as „Phases‟ with complimentary master frameworks have been assigned to the Dube AgriZone (see section 5. 2.). Currently, the Dube AgriZone has completed its First Phase and is in the preliminary stage of implementing its Second. The Dube TradePort Corporation (DTPC) acts as landlord to the farming platform and leases it to operators who function as the tenants.

Table 1: Dube AgriZone Programme Structure

| **PROGRAMME 4: AGRIZONE**<br>Strategic goal: To generate sustainable volumes of perishables in supporting the integrated air logistics platform | |
|---|---|
| SUB-PROGRAMME 4.1:<br>**DUBE AGRIZONE SERVICES** | *Strategic objective:*<br>• To provide reliable, effective and efficient AgriZone services |
| SUB-PROGRAMME 4.2:<br>**SUSTAINABLE FARMING INITIATIVES*** | *Strategic objective:*<br>• To ensure that the AgriZone is used to initiate and promote sustainable farming initiatives and businesses |
| SUB-PROGRAMME 4.3:<br>**TISSUE CULTURE FACILITY** | *Strategic objective:*<br>• To manage, operate and maintain the tissue culture facility |
| SUB-PROGRAMME 4.4:<br>**LANDSCAPING AND REHABILITATION**** | *Strategic objective:*<br>• To provide species (including rare and endangered species) for maintenance of open spaces and landscaped areas |
| SUB-PROGRAMME 4.5:<br>**DUBE AGRIZONE EXPANSION†** | *Strategic objective:*<br>• To identify and conclude agreements with suitable operators and producers |

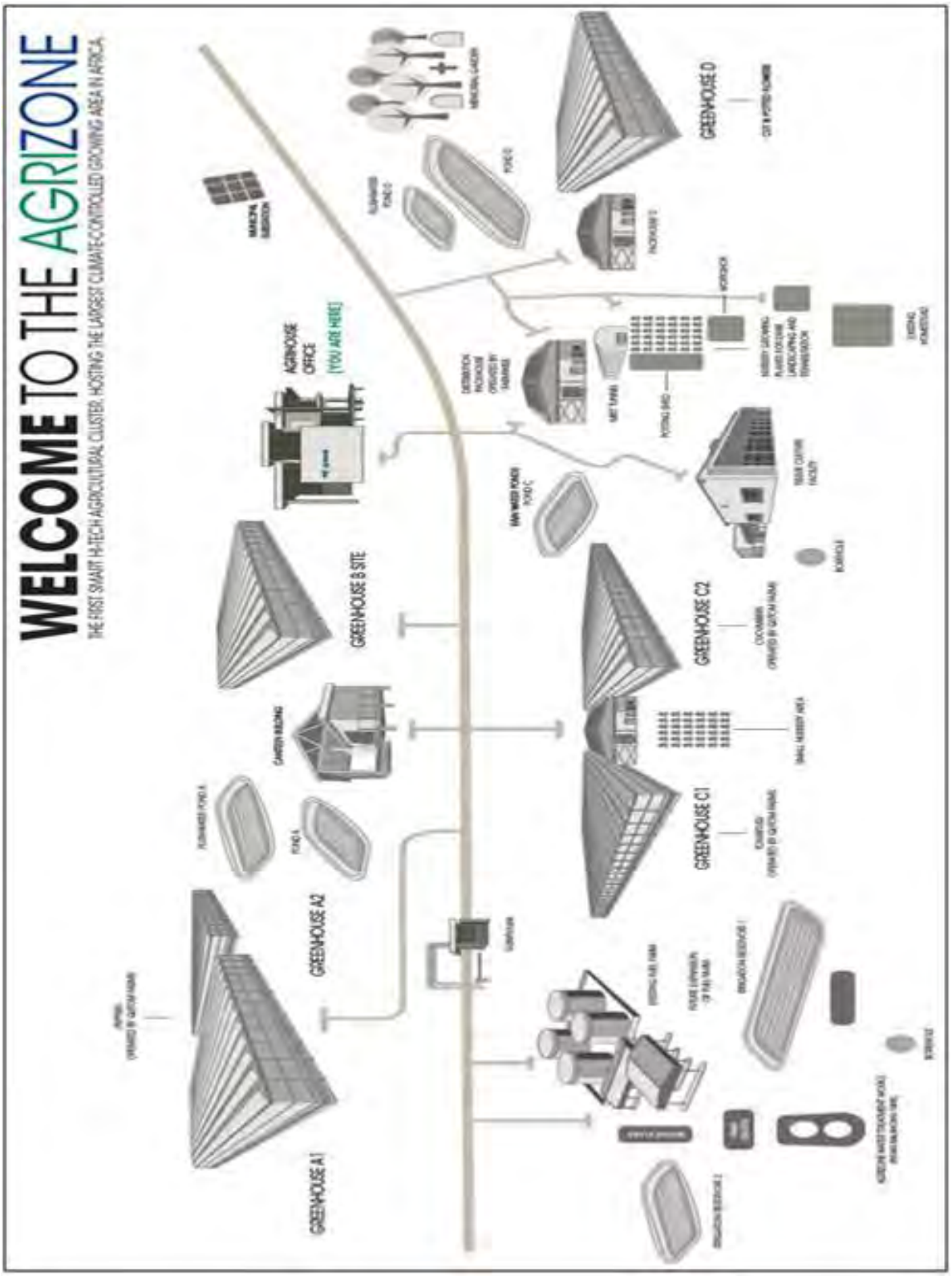
*Source: DTPC, 2012:36*

The AgriZone is operated by three tenants: Farmwise Marketing (Pty.) Ltd., Qutom Farms (Pty.) Ltd., and Carmel Nurseries [c. c.]. Farmwise Marketing is a fresh produce value-adding company that sources, processes, packages and distributes farm vegetable and fruit produce from around the country. The company operates from the Pack-house and Distribution centre. Farmwise Marketing‟s produce is supplied to major food retailers and procurement companies Woolworths (Pty.) Ltd., Spar South Africa (Pty.) Ltd. and FreshMark (Pty.) Ltd. Qutom Farms is an agricultural farming company that hydroponically grows agricultural produce. The company operates within 12 ha of Greenhouses A and C and grows multiple variations of cucumbers, tomatoes, peppers and herbs for clients Woolworths and FreshMark. Carmel Nurseries is a horticultural company specializing in the growth of cut flowers and potted plants. The company operates from 4 ha of Greenhouse D and produces Curcuma *alismatifolia* (more commonly referred to as the Thai Tulip) for export to its exclusive client, KP Holland[11] based in Amsterdam (Fig. 5; See Video 2[12]). All tenants were originally based in the Gauteng Province.

Various reports and studies were conducted prior to the Dube AgriZone‟s development. Scoping Reports were performed in 2005 and 2006. In 2007, a Specialist Report and an AgriZone Business Plan were conducted. During 2008 and 2009, an Environmental Impact Assessment (EIA) application was made and a Design and Construction Consortium for the AgriZone development was prepared. By 12th March 2010, the Dube AgriZone had received environmental approval and construction commenced on 19th April 2010 (“Dube Dreamscapes”, 2011). In 2010, the AgriZone welcomed Qutom Farms as its first tenant who initiated a pilot project growing tomatoes and cucumbers (DTP, 2014b). Thereafter, the first harvest of cucumbers, tomatoes and peppers were grown by Qutom Farms in May, June and November of 2011 respectively. After the official opening of the Dube AgriZone (See Video 3)[13], Carmel Nurseries was subsequently procured as the second tenant (DTP, 2014c). Carmel Nurseries had finalized its export contract to The Netherlands by 2013 and in February of the same year, Farmwise Marketing had been ushered in as the third tenant of the Dube AgriZone (Payne, 2013).

[11] KP Holland is a company based in The Netherlands that breeds, propagates and grows flowering pot plants (KP Holland, n.d.).
[12] Video 2: http://www.youtube.com/watch?v=O-QVdskFuuE (DTP, 2013a).
[13] Video 3: http://www.youtube.com/watch?v=Y3-Bbi5HIWA (DTP, 2012).

Figure 5: Info-graphic of the Dube AgriZone Site and Components




*Source: DTPC, 2014a*

3. 1. 2. The Dube TradePort

The DTP is a greenfield airport-city development and air logistics platform constituting the heart of the regionally evolving aerotropolis called „Aerotropolis:KZN" (Fig. 6; DTP, 2014d). DTP is considered to be the largest purpose-built[14] airport-city development in Africa serving as an airfreight and passenger hub, platform for the stimulation of multimodal[15] transit-oriented development, and Africa"s gateway for enhanced global trade and commerce (DTP, 2014b). It was officially launched on 8th March 2012.

The DTP is a 2,840 ha greenfield site situated at La Mercy in the eThekwini Municipality of KZN, South Africa. The airport city is approximately 35 km north of the city of Durban and is built upon former agricultural land held under sugar cane cultivation[16] (Robbins, 2014).

As the heart of Aerotropolis:KZN, the DTP"s main vision is: "to be a catalyst for the creation of a globally competitive multimodal trade gateway in Southern Africa" (DTP, 2014f:n.p.). Its mission is to stimulate regional economic development. The intention is to „re-tool" the local economy with a skilled workforce that captures the hidden potential of previously marginalized individuals (IHSGI [IHS Global Insight], 2009).

The DTP consists of key development zones (Dube Cargo Terminal, Dube TradeZone, Dube AgriZone and Dube City) (Fig. 7-9) and support services (Dube iConnect, Dube AiRoad and Dube AirServices) (See Video 4)[17]. Dube Cargo Terminal is an automated airfreight cargo-handling facility connected to the Dube TradeZone which is an industrial district consistent of warehousing, manufacturing, assembling, and logistics facilities. Dube City is a green commercial, residential and recreational urban development. Dube iConnect is an Information Technology and Telecommunications platform that digitally links the DTP. Dube AiRoad is a logistics fleet and Dube AirServices works in conjunction with KSIA to increase and improve on air services within the region. The DTP is currently designated as an Industrial Development

[14] Purpose-built developments are designed and built to serve a particular purpose and function.
[15] Multimodal transportation refers to mobility through usage of multiple transport means (Road, Rail, Ship, Aircraft) and services (Public or Private) (Spickermann *et al*., 2013).
[16] 78% of DTP land is undeveloped farming land (DTPC, 2013a).
[17] Video 4: http://www.youtube.com/watch?v=OcGkv89OZFI (DTP, 2013b).

Figure 6: Aerial View of The Dube TradePort Precinct

*Source: DTPC, 2014a*

Figure 7: Dube Cargo Terminal


*Source: DTPC, 2014a*

Figure 8: Dube TradeZone


*Source: DTPC, 2014a*

Figure 9: Dube City


*Source: DTPC, 2014a*

Zone (IDZ)[18] and is pending an approval to convert to a Special Economic Zone[19] (SEZ) (DTP, 2014e).

The DTP is an entity of the KwaZulu-Natal Department of Economic Development and Tourism (KZNDEDT) who administered the DTPC as a Schedule 3C Provincial Public Entity with the mandated task of bearing responsibility for the strategic planning, design, construction, management and operation of the DTP and its components (DTP, 2014f). Within the DTP precinct, the land has been subdivided according to ownership by the DTPC, ACSA and La Mercy Joint Venture Property Investments (Pty.) Ltd. (LMJV)[20] (Fig. 10). The Joint venture (JV) land is currently leased by LMJV to Tongaat Hulett Group (THG) for sugar cane farming as an interim project opportunity.

DTP‟s development is funded through three public body domains: the KwaZulu-Natal Provincial Government, ACSA and the eThekwini Municipality. An estimated R8-billion was invested in the DTP of which approximately R6,8-billion was derived from ACSA and the remainder from the DTPC. The eThekwini Municipality is responsible for the municipal infrastructural costs at the DTP site and its linkage to the surrounding Municipal infrastructural domains (Robbins, 2014).

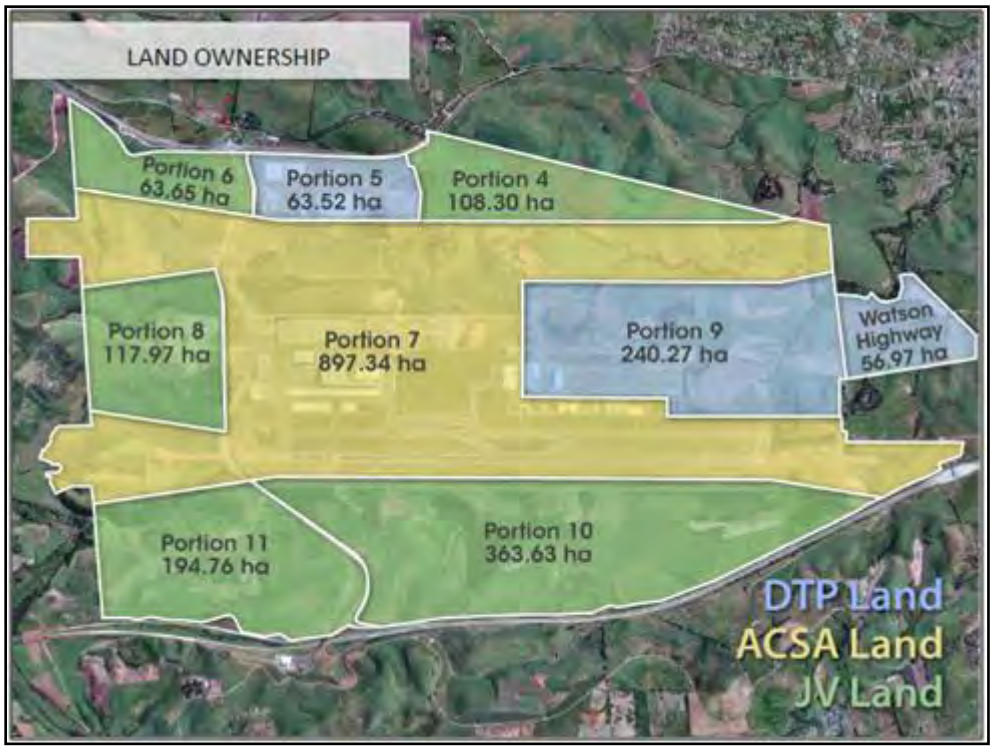
## 3. 2. Historical Development of the Dube TradePort Site and Entity

### 3. 2. 1. History of Airport Developments in Regional Durban

The first airport establishment in Durban was the Stamford Hill Aerodrome built in 1921 upon a designated site called the Eastern Vlei (Fig. 11). By 1927, the first commercial flights from the Stamford Hill Aerodrome had commenced. During the Second World War, the aerodrome ceased its operation under civil aviation and was transferred to the military. After the War in 1946, the aerodrome was transferred back to the Durban Corporation and recommenced its civil airport services (Ross, 1956). It was during the years of the War that the Durban Bay was

[18] Dube TradeZone and Dube AgriZone form the main components of the DTP IDZ (dti [Department of Trade and Industry], 2014).
[19] The SEZ Bill has been passed through the National Council of Provinces (NCOP) and is scheduled for Parliament with imminent endorsement by National Cabinet (DTPC, 2014b).
[20] LMJV is a partnership company by DTPC and ACSA that trades as „Khwezela“, of which DTPC owns 60% of its shares.

Figure 10: Land Ownership at the Dube TradePort




*Source: DTPC, 2013b*

Figure 11: Aerial View of the Stamford Hill Aerodrome Site

*Source: G. H. Pirie*

flagged as unsuitable as an aviation base. A new national airport was soon designated upon a site in Reunion which led to Durban‟s Louis Botha Airport‟s establishment in 1951 (Ross, 1956) (see Map 1).

During the late 1960s, Government had proposed that a new second airport be established to the North in La Mercy in the expected event that Louis Botha Airport to the South would have reached its full capacity (Devan, 1991). In April 1970, preliminary investigations into the site had been carried out by the Department of Civil Aviation following an announcement in May 1971, which confirmed the site would be used for the new La Mercy Airport ("Calls to use La Mercy site for housing", 1989).

Government had swiftly expropriated the land of the new site which was mainly sugarcane farming land held by Tongaat Group Ltd. (TGL). Before the 35 farms were to be demolished to level the ground and begin with earthworks, TGL pleaded with the Durban City Council to launch a Commission of Inquiry into relocating the airport site further north. Although the Natal Provincial Council had rejected the initial site based on factors of noise pollution and loss of valuable agricultural land, the National Department of Transport vetoed the decision forcing farmers to abandon their farms and by March 1974, the site was completely taken over (ACSA-DTP, n.d.; "Calls to use La Mercy site for housing", 1989).

June 1975 marked the initial earthworks of the La Mercy airport site at an initial estimated cost of R18-million to be completed by 1979. However, during the 1970s and 1980s, La Mercy‟s airport plans were disrupted for various reasons. TGL did not settle for farm land expropriation and demanded to be compensated. Construction was halted on multiple occasions and the date of completion was repeatedly postponed due to a lack of funding owing to the recession, controversy over issues of bribery, indecision over ownership due to private enterprise offerings for the land, and pressures mounting due to the inadequacies of the slowly deteriorating Louis Botha Airport. Although pressures to sell the La Mercy site began to surface, the Government refused all offers and remained unwilling despite the fact that they knew they could not afford to build the airport ("Our Phantom Airport", 1985). The expropriated land was then leased to the newly-merged THG around 1983 during the interim.

In the approach to the end of an Apartheid state and a new democratic era and Government, a 1993 study by the Department of Transport suggested that Louis Botha Airport be downgraded to a regional operating airport whilst renovations would occur in preparation for the expected 1995 Rugby World Cup Tournament arrivals, and that La Mercy should be the city‟s main airport (Campbell, 1993; Ross, 1994). On 23rd July 1993, ACSA was formed as a public autonomous commercial company with the South African Government as its chief proprietor through the Department of Transport to own and manage the countries airports (ACSA, n.d.).

In 1994, the first democratic announcement that a new international airport would be built at La Mercy was made by the then KZN Provincial Member of the Executive Council (MEC) of Economic Affairs and Tourism, Jacob Zuma, at a conference in London ("Airport is Natal‟s „95 priority", 1994). Zuma had highlighted that it would be a means of economic revival and development for the region ("Airports", 1994).

A joint-study by the KZN Provincial Government and ACSA in 1995 complimented with the works of international consultants Greene Belfield-Smith was commissioned. The study recommended that Louis Botha Airport, renamed Durban International Airport (DIA), be downgraded and the land could be sold for industrial development ("Airports", 1994; "La Mercy airport project proposal due for debate", 1994). Selling DIA was envisioned to enable revenue pooling and cease governmental airport subsidies in order to allow private sector funding and investment to finance the new La Mercy airport for the city ("Airport is Natal‟s „95 priority", 1994; AECOM-McClier, 2002).

An additional evaluative study on the airports relocation was conducted by Schiphol Group in 2000. The Schiphol Group study had indicated that the relocation and development of a *passenger-focused* airport for La Mercy would incur a negative economic gap[21] of R173-million. As a recommendation of their study, it suggested that the KZN Provincial Government upscale their intentions in creating an *aerotropolis-platform* development.

A master-plan researched by AECOM-McClier Corporation in 2001 for a potential aerotropolis in the region prompted the calls for its mobilization and was soon received by the South African Government (AECOM-McClier, 2002; ACSA-DTP, n.d.).

[21] An unexplained jargon term reported in the literature.

3. 2. 2. The Development of the Dube TradePort

In April 2002, the South African National Cabinet approved the Government‟s decision to invest in an airport development at La Mercy (DTPC, 2014b). The development was named the „Dube TradePort‟ in honour of a highly-regarded figure in South African history: the late Dr. John Langalibalele Dube[22] (DTP, 2014c).

The Dube TradePort Company was established in 2003 by the KZN Provincial Government as a Section 21 Company[23] which was to facilitate the design, construction, and management of the DTP (DTPC, 2010; DTP, 2014c). By 2004, the KZN Provincial Government had seized the site at La Mercy through issuing expropriation notices to land holders (ACSA-DTP, n.d.).

Following the May 2004 announcement of the FIFA Soccer World Cup to be hosted in South Africa, an integrated master-plan for the DTP was developed in 2005 with National Cabinet approving the new airport-development in La Mercy (Robbins, 2014; DTP, 2014c).

In December 2006, the DTP Company and ACSA signed a Co-operation Agreement which served to formalize the relationship as a Public-Public Partnership. According to the Agreement, ACSA‟s responsibilities were to build, operate and manage the new international airport as its owners, and the DTP Company was to develop and manage the DTP components as its custodians (IHSGI, 2009).

In finalizing the Co-operation Agreement and in anticipation of DIA‟s imminent decommissioning, ACSA had launched a sales-call for the DIA property. Transnet SOC Ltd.[24] had displayed its interest in the DIA site with intentions to develop the area as a back-of-port logistics operation conducting port-related activities[25]. By November 2006, ACSA awarded the Ilembe Consortium[26] the contract to build the new airport and in August 2007, La Mercy‟s airport construction had commenced (Naidoo, 2008; Young, 2011). After obtaining first right of

[22]The late Dr. John Langalibalele Dube was the first President-General of the former South African Native National Congress, which later became the African National Congress (ANC).
[23] Non-profit Company guided by the Companies Act (Act No. 61 of 1973) (KwaZulu-Natal Dube TradePort Corporation Act [KZNDTPCA], No. 2 of 2010).
[24] Transnet SOC Ltd. is an integrated freight transport company.
[25] Activities and facilities such as cargo-handling, container-storage, liquid bulk storage and coastal fuel terminal, automotive supplier parks, petro-chemical industry, as well as other light industry.
[26] Ilembe Airport Construction Services (Pty.) Ltd. (Ilembe Consortium) was the airport contractor and entity which comprised of 18 companies.

refusal to the DIA site in 2007, Transnet submitted an application to approve the sites acquisition at an estimated cost of R1,726-billion whilst the finalized sale remained undetermined (ACSA-DTP, n.d.).

In 2010, the La Mercy airport was officially named the King Shaka International Airport (ACSA, 2010). Thirty-two months after construction began in August 2007, KSIA was completed in April 2010. DIA had ceased its operations on 30th April 2010 and on the following day KSIA began its first operation just in time to greet local and international FIFA Soccer World Cup visitors (Corcoran, 2010; Robbins *et al*., 2011).

On 1st April 2011, legislation was gazetted that the DTP would transition from a Section 21 Company into the Dube TradePort Corporation– a Schedule 3C Provincial Public Entity owned by the KZN Provincial Government. DTPC‟s responsibilities for the DTP fell under the KZNDTPCA (DTPC, 2012). In due course, the DTP had welcomed its first investors, delegates, tenants and operators and officially opened in March 2012 (Harrilall, 2012; DTP, 2014c).

## CHAPTER 4: Methodology

### 4. 1. Introduction

This chapter presents the approach, various methods, and processes that were involved in conducting this study. The methods applied in gathering both the primary and secondary data for this research are identified and described. The chapter finally concludes with details on the ethical considerations and research limitations of the study.

### 4. 2. Case Study Approach

This research was conducted as a case study of the Dube AgriZone. Several definitions of case study research appear throughout the methodologies literature. The definition found to encapsulate the nature of this particular case study was a "process of conducting systematic, critical inquiry into a phenomenon of choice and generating understanding to contribute to cumulative public knowledge of the topic" (Simons, 2009:18). It is understood that case study approaches have an inherent story-telling potential where the main foci of inquiry are situated amongst numerous variables (eg. social, cultural, economic, historical and political) that characterize the case as a system. The case study represents a comprehensive research strategy as an accumulation of information that is gathered to compile a coherent story, not necessarily in a chronological manner, but whereby the inferences and interpretations of the data are logically articulated in the development of the narrative (Simons, 2009).

Different types of case studies are classified as intrinsic, instrumental or collective. Intrinsic case studies are defined by the researcher‟s personal interest in the case itself. Where an exploratory issue is prevalent or a predetermined question is established, the case study is instrumental. If several case studies are identified, it is considered collective (Simons, 2009). This case study research was both intrinsic and instrumental. The Dube AgriZone was a system that the researcher was actively influenced by (on occasion a beneficiary[27]) which made for the intrinsic interest within the case. The Dube AgriZone was explored on the basis of the project‟s objectives

[27] The researcher has purchased fresh produce from food retailers that have procured produce from the Dube AgriZone.

to gain insight into the operation and nature of the project outcomes which accounted for the instrumental character of the case study.

Theoretical frameworks of case studies are considered as either theory-led or theory-generative. Theory-led approaches contain an overarching theoretical framework that is used to guide the data collection processes. In this regard, the theoretical framework is not standardized, but rather, contextually shaped by the nature of the case itself. Theory-generative case studies are guided by the nature of the data discovered throughout the data collection process that generates the theory for the research (Layder, 1998; Bryant & Charmaz, 2007). Although classified as separate entities, this study was influenced by both techniques and constructed the theoretical framework of the case study in hybrid-fashion.

Although case study research has its strengths and limitations, the former appears to outweigh the latter. Some of the strengths according to Simons (2009) are stated as follows:

* Case studies allow for an in-depth account of a system whereby both the experience of the researcher and the dynamism of the complex system can be contextualized in tandem;
* It has the potential to document a wide range of perspectives, interactions and viewpoints sourced from both the researcher and research participants;
* Case study research is not confined to the application of fixed methods. Whatever is most appropriate and suited toward the research is encouraged making it flexible, and;
* The inherent story-telling potential allows the research audience to engage with the material, not just on an informative basis, but as an experience of the researcher‟s observed activities within the system.

Citing Walker (1986), Simons (2009) makes reference to the limitations of case study research as a process of „othering‟, reality-distortion and essential conservatism. However, researcher-subjectivity is inevitable and if appropriately supervised will not distort the condition of the case study or conserve it as a study locked in time.

Considering the nature of the case study approach in its entirety, from its definition, purpose, characteristics, varieties, and pros and cons, made for an adequate analytical process for the researcher to validate the case study approach as suitable.

## 4. 3. Research Methodology

Gathering both primary and secondary data for this study was done using various methods. Methods are the techniques that configure the form of a study, not necessarily defining it, but influencing its structure through using methods as tools. This section will describe the methods that were applied in gathering both the primary and secondary data sources.

### 4. 3. 1. Secondary Data

A systematic and efficient method was used to gather the secondary literature for this study. The literature review presented a contextual and theoretical framework related to the main research topic. The main method used to gather secondary resources was through the search-engine „WorldCat.org". This search engine was used because it provided the researcher with authorized access to the most academic databases. Numerous search-engine parameters enabled a uniquely customized search. Certain keywords and phrases were assigned to the contextual and theoretical narratives and used to perform the search inquiries. The material displaying the most relevance to each topic was subsequently chosen. Details of the literature-search were logged into a Microsoft Excel Spreadsheet to keep track of resources and avoid duplication. Other resource domains that were consulted were the African Studies Library and Special Collections Centre, Government Publications Centre, and Interlibrary Loans Service of the University of Cape Town (UCT).

### 4. 3. 2. Primary Data

The main techniques applied in gathering primary data for this study included performing interviews, document and material analysis, and observational recording. The overall sampling design of this research was characterized as a qualitative case study.

4. 3. 2. 1. Interviews

Key informant interviews were requested and conducted amongst various persons involved in the Dube AgriZone development and operation whether directly or indirectly. The companies and organizations that were contacted to participate in this study are indicated in Table 2. The table documents the outcome of the interviewee requests where some were accepted, declined or received no response. Each interviewee has also been coded for referencing purposes according to their agreed preference of remaining anonymous or not for the study. On one occasion, an interviewee wished to remain completely anonymous with no reference to their company or organizational affiliation, and was thus coded accordingly.

Selecting potential interviewees was done according to the chain of command of each company, department or organization starting with the most senior official. Contact details of each interviewee were tabulated and confidentially kept for the records of this study. Each interviewee was affiliated toward the DTP or the Dube AgriZone differently and thus each interview had to be compiled bearing the diversity in mind. A generic set of questions were formulated and used as a guide allowing appropriate tailoring of each interview to the interviewee.

Interviews were determined on the basis of the interviewee‟s availability and their preferential form of being interviewed (either in person, via e-mail correspondence, telephonically, or via Skype). Prior to each interview, a few documents were sent to the interviewees (or to their Personal Assistants) consisting of a brief of the arranged interview, a „Research Terms of Agreement‟ document, and proof of Ethical Clearance (see Section 4.5.). A document summarizing the points of discussion of the interview was compiled and sent to the interviewees to allow them to be better prepared for the interview beforehand. The interview lengths ranged from between 30 to 90 minutes, were captured using a voice recording device, and were subsequently transcribed.

Table 2: Interviewee Details and Reference Codes

| Company/ Organization | Date of Interview | Interviewee | Interviewee Position | Reference |
|---|---|---|---|---|
| DTPC | **Declined** | - | - | - |
| Dube AgriZone | 27th May 2014 | Mr. Mlibo Bantwini | AgriZone Executive | Bantwini, 2014 |
| ACSA | 28th May 2014 | Mr. Terence Delomoney | KSIA General Manager | Delomoney, 2014 |
| ACSA | 28th May 2014 | Mr. Ven Moodley | KSIA Manager of Finance and Procurement | Moodley, 2014 |
| Tongaat Hulett Developments (THD) | 28th May 2014 | Mr. Greg Veerasamy | Development Executive | Veerasamy, 2014 |
| Rhino Agrivantage | 4th June 2014 | Anonymous | Representative | RA Rep. 2014 |
| Farmwise Marketing (Pty.) Ltd. | 3rd June 2014 | Anonymous | Representative | FM Rep. 2014 |
| Qutom Farms (Pty.) Ltd. | 26th May 2014 | Anonymous | Representative | QF Rep. 2014 |
| Carmel Nurseries [c. c] | 4th June 2014 | Anonymous | Representative | CN Rep. 2014 |
| KP Holland | **No Response** | - | - | - |
| Kwanalu | **Declined** | - | - | - |
| Dube AgriZone CSI | 5th June 2014 | Anonymous | Representative | Dube CSI Rep. 2014 |
| South Durban Community Environmental Affairs (SDCEA) | 5th June 2014 | Anonymous | Representative | SDCEA Rep. 2014 |
| Airports Farmers Association (AFA) | 6th June 2014 | Mr. Siga Govender | Chairman and Farmer | Govender, 2014 |
| Phulisani Solutions | 6th June 2014 | Anonymous | Representative | PS Rep. 2014 |
| LIV Flowers | June 2014 | Anonymous | Representative | LIV Rep. 2014 |
| Woolworths (Pty.) Ltd. Farming for the Future | June 2014 | Anonymous | Representative | WW Rep. 2014 |
| Transnet | **No response** | - | - | - |
| Reliable Source | June 2014 | Anonymous | Reliable Source | Anon. 2014 |

#### 4. 3. 2. 2. Document and Material Analysis

A large portion of the primary data for this study relied upon resources from academia (contextual narratives and theories), the media (newspapers, the Internet, and pamphlets), and formal governmental, business and organization documents and records (presentations, reports, plans, and digital media). According to Simons (2009), document analysis is not confined to just formal documents and records, but *anything* that has been produced about the site or system under research.

#### 4. 3. 2. 3. Observation

Although observation might not be interpreted as a worthy technique, it is an inevitable action that is performed in the field once a researcher enters and leaves the premises. Observation is a technique that is naturalistic. It is done so without an obvious display of intent whilst in the field. Observation assists in generating a comprehensive narrative of a system within a case study by documenting the *experience* of being within the site as opposed to the data given on how the site is meant to operate. Observation also allows for the documentation of censored, undocumented and uniformed findings. In this sense, observation is useful to add to the richness of the comprehensive story (McKechnie 2008). A digital camera was used to digitally record the observations of this research on site visits.

### 4. 4. Data Consolidation and Analysis

The data collected for this research was consolidated into three main sections that were determined according to the three main objectives of this study. Information from interviewee transcriptions was thematically grouped and consolidated under the research objective with which it was associated with. It was the most effective manner in which to consolidate and analyse the collected data because in some cases overlapping agendas had surfaced which guided the framework for its analysis.

## 4. 5. Ethical Consideration

The primary ethical concern in this research was to ensure and uphold the integrity of the study, reporting all information accurately and fairly. Ethical Clearance was awarded for this study by the Faculty of Science Research Ethics Committee (FSREC) at UCT. The Ethical Clearance document was used to provide assurance to the research interviewees of the study‟s ethical approval.

In addition to the Ethical Clearance document, a Research Terms of Agreement document was compiled by the researcher and sent to each of the study participants prior to the scheduled meeting. This document contained: details about the research project; the confirmed date, time and venue for the scheduled interview; contact details of the researcher, Supervisor, and Environmental and Geographical Sciences Department (under which this research took place); the option to request a copy of the interview; and whether to remain anonymous for the study or not. In cases whereby anonymity of a participant was requested, the interviewee was referred to as a representative (or otherwise stated as preferred by the interviewee) of the organization, business or department that he or she was from. Approval for conducting the study was granted in the process by the DTPC and access to the site was arranged with no difficulties.

## 4. 6. Research Limitations

Despite being systematically planned, this case study research faced some challenges. The challenges that surfaced were temporal, institutional and structural in nature. The Dube AgriZone is within its infancy stages which inflicted a temporal limitation upon the study. Phase 1 has been executed, but Phase 2 has yet to be implemented. This case study is a reflection of the development and outcomes of the Dube AgriZone project thus far.

Intentions to interview some of the agricultural organizations and unions within KZN were struck with an institutional limitation whereby all the groups were evidently hesitant and some declined to be part of the study.

One of the structural constraints in performing this study was experienced in wanting to interview the new employees of the Dube AgriZone. The employees working on the production and cultivation floors worked according to the clock and interviewing each employee, even on a

one-by-one basis, would have slowed-down the entire operation. Translating the interviews and handing out printed copies to the employees to fill in after-hours was considered, however, there was no guarantee that the questionnaires would be fully understood without the presence of the researcher and handed back in time, or whether everyone was literate. The questionnaires would have contained information that could be deemed personal and the absence of the researcher would have made for an impersonal experience. It would not have been a useful tactic in gaining the trust of the employees either, and so it was abandoned.

In future, these limitations could be overcome by performing a similar study in years to come and during the build-up to those years, using the time to develop more interpersonal relationships with people within and related to the system so that they are aware of the researcher‟s true intentions eliminating any doubt that the research could potentially cause any harm.

## 4. 7. Chapter Summary

In order to conduct a study of a system or phenomenon with the intentions of it being simultaneously systematic, critical and informative, a case study approach was chosen because it offered the best narrative format in which to satisfy those intentions. The malleable nature of the case study approach made it preferable to any other because it allowed room for dynamism and diversity in interpretation. The techniques used to collect data in this study were associated with common methods applied in case study research, and they proved useful. Maintaining the ethical nature of this study was upheld. There were some research limitations in performing this study, however, they did not entirely threaten the viability of carrying out the research.

CHAPTER 5: Research Findings

This chapter presents the findings of this study and is divided into 3 sections. Section 5.1. reveals some of the insights into the development of the DTP which this research was capable of identifying[28]. The section also provides insight into airport agriculture in regional Durban. Section 5.2. presents the Dube AgriZone‟s Phase 1 and 2 operational models and motives. Section 5.3. presents the findings on the current operational performance of the Dube AgriZone. The operational performance has been examined through each of the Dube AgriZone tenants, Dube AgriLab and DTP‟s Corporate Social Investment (CSI).

## 5. 1. Dube TradePort‟s Development and Airport Agriculture Insights

### 5. 1. 1. Research Findings on Dube TradePort‟s Development

*Political Issues*

During the development of the DTP, some of the stakeholders were apparently not satisfied with the processes involved. A political dispute over land ensued amongst the KZN Provincial Government, eThekwini Municipality, ACSA, and THG. This study found that ACSA was not in favour of relocating the airport to La Mercy when National Cabinet had announced that it would.

ACSA intended to focus on developing and improving the DIA as a spoke, with O. R. Tambo International in Johannesburg as the hub, as part of its hub-and-spoke[29] vision. In 1998, 20% percent of ACSA‟s shareholding was sold to Aeroporti di Roma[30] (ADR) and its commercial and developmental interests were not in line with investing in a new airport.

It appears that although National Cabinet‟s approval for the relocation of the airport was issued, an inclusive participatory process was not followed in making this decision. Whilst the Airports Company Act[31] defines the closure and relocation of an airport to fall under the ambit of ACSA‟s regulation committee and its shareholders, ACSA was not a participant of the consultation

[28] Other issues may certainly exist, but the section deals with only what was identifiable within the researcher‟s capacity.
[29] Hub-and-spoke networks are geographical route systems whereby a centrally located city with the largest concentration of services and facilities would be the „hub‟ and the „spokes‟ would be the outlying nodes or smaller feeder cities that are connected to the hub (O‟Kelly, 1998; Bryan & O‟Kelly 1999).
[30] Aeroporti di Roma is an Italian airports-management firm.
[31] Airports Company Act No. 44 of 1993 (ACSA-DTP, n.d.).

process and team that advocated for the airport to be relocated (ACSA-DTP, n.d.). According to ACSA‟s KSIA General Manager, Mr. Terence Delomoney, ACSA‟s views on the relocation of the airport were expressed as the following:

> *“ACSA had its own visions... we didn‟t necessarily see us doing it at the point in time when we built it. In terms of our planning it would have happened a few years later... everybody else wanted this thing to happen quicker... The decision to move was a Cabinet decision” – (Delomoney, pers. int., 2014).*

ACSA would have invested in La Mercy only when it felt that the DIA had reached its full capacity projected for sometime between 2017 and 2020. DIA was supposedly profitable as it was and La Mercy‟s new airport was just not compelling of a business case for ACSA (“Africa‟s trade gateway”, 2004).

Tensions in developing the DTP site were also felt between THG with the State, DTP and the eThekwini Municipality. In 2008, a disagreement between THG and the eThekwini Municipality surfaced when the Municipality threatened to expropriate some of THG‟s land under sugarcane cultivation for an integrated housing development project. It is alleged that in 2009, THG was reluctant to engage in a partnership with both the State and DTPC to provide infrastructure and industries in place of the sugarcane lands within the region in order to compliment the airport activity, and were accused by the former DTPC Chief Executive Officer (CEO) of „„corporate greed‟ (Khanyile, 2009).

The development of a new international airport was considered higher on the KZN Provincial Government‟s agenda than on the eThekwini Municipality‟s, but with the former representing a higher jurisdiction over the latter, the Municipality interests were superseded (Robbins *et al*., 2011).

*Fiscal Issues*

Funding of the DTP Project was sourced through three public domains: the KZN Provincial Government (through the DTPC), ACSA and the eThekwini Municipality. Initially, the DTP was conceptualised by the Government as a Public-Private Partnership (PPP), with a 35-year time-lined master framework at an estimated project cost of R1,370-billion. However, the Government decided to proceed with the DTP Project under non-PPP procurement methods with a new project cost of R8-billion and designated ACSA as an equity partner of the DTP Project (ACSA-DTP, n.d.).

ACSA felt pressurized to cover the capital costs of KSIA with an obligation to invest R6,8-billion. It is alleged that ACSA had an existing debt burden of R8-billion arising from developments at its other airports. Therefore, ACSA had to increase its airfare charges to raise the contributive revenue toward the DTP Project and its existing debt-relief (Robbins, 2014). ACSA‟s costs were compounded further when the FIFA Soccer World Cup had placed a time limit on how long ACSA had to construct the airport. KSIA‟s Manager of Finance and Procurement, Mr. Ven Moodley, specifically commented on the issue:

> *"We were restricted in terms of the timeframe which we had to build the airport. We had to outlay more money to speed up the construction.... we didn"t have that great-of-time for us to have done in-depth research so that could have been done a little bit better... It would have helped us to save a lot of money"– (Moodley, pers. int., 2014).*

Delays in the eThekwini Municipality‟s approach toward issuing the EIA for its municipal projects led to further costs in the form of delay-damages amounting to R720-million that ACSA and DTPC had to cover (ACSA-DTP, n.d.). ACSA has admitted to its continued issues with bulk infrastructure at the DTP and have had to provide their own temporary waste-water treatment facilities whilst they await the Municipality‟s efforts to connect them to a permanent waste-water works system (Delomoney, pers. int., 2014).

*Administrative Issues*

In August 2012, a few months after the formal launch of the DTP, the DTPC‟s CEO had resigned following allegations of improper corporate conduct. It led to a forensic investigation into the apparent deal with the Director of Worldwide Flight Services South Africa[32] (WFS-SA) in which the CEO would acquire 40% of the company if the CEO assisted WFS-SA‟s expansion to a point whereby WFS Global would purchase WFS-SA (Jansen *et al*., 2012). Criminal charges were laid against the former CEO, and news on the matter went viral throughout the media.

*Land and Infrastructural Issues*

During 2012, municipal demarcations were contested amongst DTPC, ACSA and the eThekwini Municipality. DTPC suggested that the DTP be incorporated into the adjacent Ilembe District Municipality by shifting the boundary southwards because officials of the neighbouring Municipality were more in favour of the entity‟s developmental objectives. The bid to shift the municipal boundary was not accepted, however, applications were subsequently made toward the National prioritization of the DTP project as a SEZ which would then receive National support through The Presidency as an alternative avenue for pursuing the DTPC‟s agenda (Robbins, 2014).

The relocation of the airport meant that staff members operating at the former DIA were to make a different, and in most cases, further commute to work. ACSA has incurred the costs for a transportation service for their staff members because the Municipality‟s public transportation system to the DTP is considered extremely inefficient and insufficient (Delomoney, pers. int., 2014).

Conversely, the DTP demonstrates air transportation efficiency (Nevin, 2010). On the coast of KZN, a sea-level runway poses fewer restrictions to air transportation in terms of weight limitations, fuel consumption, and take-off schedules. An aircraft at the DTP‟s KSIA can take-off during both day and night time, uses less fuel, and can carry a heavier cargo-load because the higher density of the regional atmosphere permits such conditions (Phillips, 2011).

[32] WFS-SA had obtained a contract to operate from the Dube Cargo Terminal (Jansen *et al*., 2012).

*Environmental Issues*

During the development of the DTP, the eThekwini Municipality‟s Environmental Planning and Climate Protection Department voiced their concerns over the DTP site construction affecting the local ecosystems which formed the basis of their motivation for the DTP to be rezoned elsewhere.

One of the major concerns was in relation to the local Barn Swallow population (ACSA-DTP, n.d.). The Barn Swallows are a migratory bird population that roost in Lake Victoria at Mount Moreland which is 3 km away from, and in the direct flight path, of KSIA (Fig. 12 & 13) (Cole, 2008; Mount Moreland Inkonjane, n.d.). Estimates are that 3 to 5 million of the Barn Swallows migrate from Europe and Russia to Lake Victoria every year from October to April (Cole, 2008; Andrews, 2010).

A Flora and Fauna Specialist and Avian Biodiversity Study were undertaken to determine the impact for both airport and bird populations (DTPC, 2011). One of the first bird radar systems at a commercial airport was implemented at KSIA to monitor the movements of the birds in relation to the flight paths of aircrafts (Fig. 14).

Research findings had shown with radar data collected since 2007 that it was possible for the Barn Swallows and new airport to co-exist (Mount Moreland Conservancy, n.d.). Despite the findings, the DTP State of the Environment Report states that: “[i]t is in fact likely that the area around the airport will become more attractive to the barn swallows and other birds after construction, because managed manmade habitats due to their higher abundance of insects and other animals are preferred over more natural habitats” (DTPC, 2011:28).

Figure 12: Barn Swallow Birds abundant in the sky at Mount Moreland

*Source: DTPC, 2011:31*

Figure 13: Aerial View of Mount Moreland and King Shaka International Airport in the Distance


*Source: Mount Moreland Inkonjane, n.d.*

Figure 14: Bird Radar System near King Shaka International Airport

*Source: Mount Moreland Conservancy, n. d.*

5. 1. 2. Airport Agriculture in Regional Durban

*Airport Farmers*

This study found that agricultural activity at an airport was not a first for the Durban region. Adjacent to the former DIA site, farming activity has taken place by a group of 16 farmers upon 187 ha of land belonging to ACSA (Gedye, 2012; Coan, 2013) (Map 3; Fig. 15). These urban-agriculture airport farmers consist of a group of 4 females and 12 males, ranging from ages 32 to 80, and have approximately 130 years of combined experience in farming (AFA, n.d). The farming arrangement was such that ACSA was landlord to the farming land and the farmers were its tenants who grew a variety of fresh produce (Premdev, 2006). The produce was supplied to major retailers (Shoprite, Checkers, OK Stores, Hanee Fresh, and Sunrise Group and Fruiterers),

Map 3: Airport Farmland at the Former Durban International Airport (outlined in red)


*Source: Google Earth, 2014*

Figure 15: Airport Farmland at the Former Durban International Airport with Airport Oil Storage Tanks in the Distance

*Source: AFA, n.d.*

municipal markets[33], and vendors within the region (SDCEA [South Durban Community Environmental Alliance], 2006).

*History of the Airport Farmers*

The airport farmers are descendants of 19th century former indentured labourers from India (Moolla & Paruk, 2009; Govender, pers. int., 2014). During the colonial era, Indian farmers were limited to farming on lands South of Durban yet its location was still favourable because the land was much cheaper (Moolla & Paruk, 2009). After many years, the Indian farmers were forcibly evicted by the industrialization of those regions during the 1970s (SDCEA, 2008).

The farmers were moved again after massive flooding that occurred in 1987 that caused a nearby canal to burst its banks contaminating the farmland with toxic chemicals discharged from industry within the region (Pillay, 2013). It prompted the arrangement of land and housing reallocation to the North of the City for some of the evictees who subsequently had to quit farming because the new residential site was too far from the newly designated farming site adjacent to the former Louis Botha Airport which was given to the farmers in 1988 by the House of Delegates[34] (Fig. 16).

Over the years, the farmers invested in the land by contributing to its viability for agriculture (Moolla & Paruk, 2009). After the democratic transition, the airport and its surrounding landscape were transferred to ACSA who subsequently allowed the continuation of farming by placing the farmers under a monthly tenancy arrangement (SDCEA, 2009).

*Recent Developments at the Durban International Airport Site*

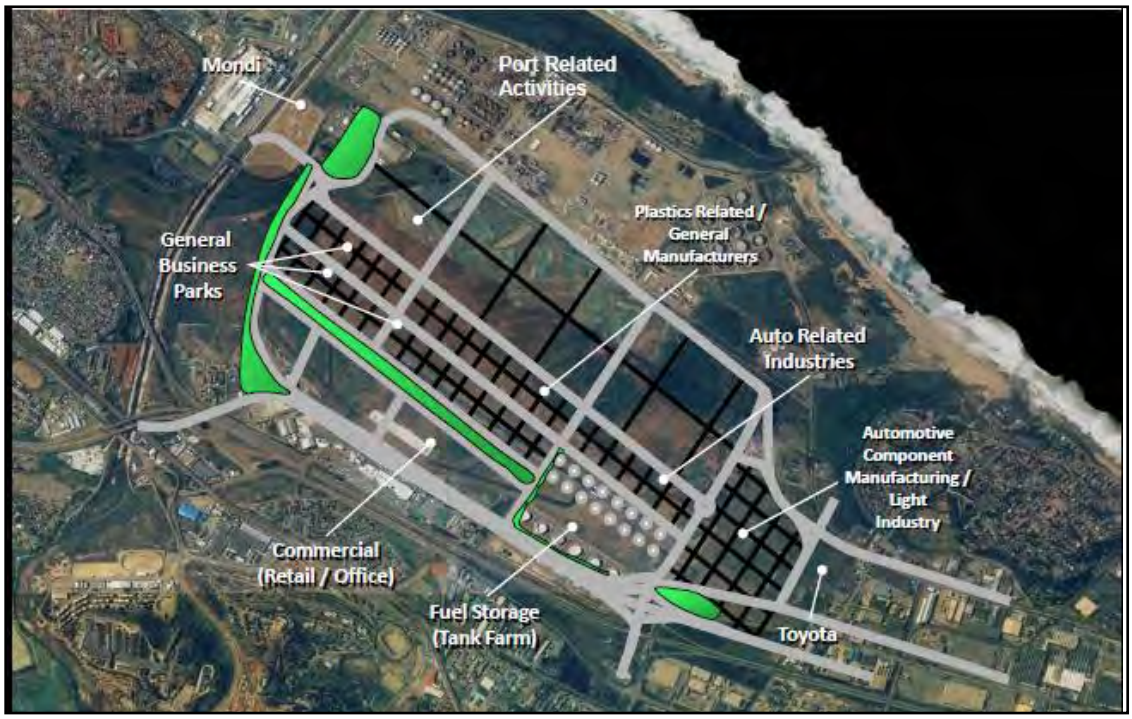
Since the National Cabinet approval was given to develop a new airport in La Mercy, ACSA intended to develop the DIA site through corporate investment (Fig. 17). ACSA launched a sales

[33] The airport farmers are also referred to as the „Market Gardeners" in this respect.
[34] The House of Delegates was the „Indian" representation body within the Tricameral system of Parliament in South Africa (Lemon, 1990).

Figure 16: Airport Farmers clearing land adjacent to the then Louis Botha Airport

*Source: Rajgopaul, 1983*

Figure 17: ACSA"s Investment Plans at the former Durban International Airport Site




*Source: ACSA-DTP, 2008*

call in 2006 with initial proposals received from British Airways, Comair, Checkers and Toyota.

When ACSA released the redevelopment details, the airport farmers formed a coalition, the Airport Farmers Association (AFA), to contest the proposals because it incorporated their farmland and would lead to their displacement. The South Durban Community Environmental Alliance[35] joined AFA in their plight to keep their farmland (SDCEA, 2008).

In April 2012, and much to the surprise of AFA, ACSA had finalized the DIA property sale inclusive of the airport farming land, to Transnet for R1,8-billion (Nevin, 2012; Joubert, 2013b). Transnet plans to convert the DIA site into the Durban Dig-Out Port (DDOP) (Fig. 18 & 19).

The DDOP is intended to address the increasingly limited capacity at Durban Port in meeting container handling and storage demands whilst serving as an integral component of Aerotropolis:KZN. The first phase of the DDOP is scheduled to commence with construction in 2016 by which its first phase would be complete by 2019 (Nevin, 2012). The DDOP is projected to create 20,000 new employment opportunities with 47,000 indirect jobs during its construction which should be completed by 2037 at a total cost of R100-billion. (Jansen van Vuuren, 2011; Mkhize 2014).When fully operational, the DDOP is set to contribute an annual R56-billion to the country‟s Gross Domestic Product (GDP) (Joubert, 2013b).

[35] The South Durban Community Environmental Alliance is an environmental NGO that was formed in 1996 (SDCEA, 2008).

Figure 18: Proposed Durban Dig-Out Port Site, indicating Airport Farmland (outlined in red)

*Source: New Durban dug-out Port– tenders released, 2012*

Figure 19: Engineer‟s Impression of the Durban Dig-Out Port

*Source: New Durban dug-out Port– tenders released, 2012*

*What about the Airport Farmers?*

This study found that the final sale and consequences of the sale of the DIA property and airport farmland to Transnet were never discussed with the airport farmers. Mr. Sigamoney Govender, Chairperson of AFA, had the following to say:

> *"Look, the sale and when it was sold... they never mentioned it to us farmers whatsoever… I only saw it in the paper, and when Transnet took over the land, they sent us a letter in 2012 stating that they the new owners of the land, rental should go to them and they gave us their banking details... According to Transnet we on a monthly basis, and whenever we need to go, we must go. That was their instruction."– (Govender, pers. int., 2014)*

According to Delomoney (pers. int., 2014), ACSA engaged with the Department of Agriculture to figure out an alternative site for the farmers in the event that the land were to be developed. ACSA"s proposals to the farmers were either to farm on a 30 ha plot of land, or for ACSA to assist the farmers in finding alternative jobs at the DDOP (Moolla & Paruk, 2009). The offers were not received well by the airport farmers who were of the opinion that they had invested several tangible and intangible assets into the airport farmland, and alternative employment at the DDOP would be absurd for individuals with specialised skills in urban agriculture (SDCEA, 2006). On the sale of the DIA site, Delomoney commented that:

> *"The decision to sell the property is the decision of the landlord and the person that it is selling it to... we wouldn"t nœessarily seek input from our tenants to sell property... That land was sold as is to Transnet, so Transnet will now have to deal with that. The farmers need to be proactive too, for alternatives"– (Delomoney, pers. int., 2014).*

This study attempted to interview Transnet about the future of the airport farmers, but was met with no response. In fact, a SDCEA representative has shared a similar experience over the years:

> *"We have asked on numerous occasions for Transnet's plans regarding the farmers and their land, but we have received no answers"– (SDCEA Rep., pers. int., 2014).*

*Reaction to the Sale of the Airport Farmland*

This study found that an attorney had represented AFA in effort to maintain their farmland. According to Govender (pers. int., 2014), the attorney approached ACSA and DTPC to suggest that the airport farmers be given the opportunity to farm at the Dube AgriZone. However, DTPC had declined the proposition since they had already made arrangements for farming at the Dube AgriZone.

AFA and SDCEA arranged to meet with Transnet, but when the meeting was conducted, it is alleged that Transnet admitted to having no plans for the airport farmers which resulted in both AFA and SDCEA to walking out the meeting (Govender, pers. int., 2014).

On 1st December 2012, the SDCEA, AFA and 800 community members protested against the airport farmers' eviction by occupying the entrance to the DDOP (Fig. 20). A memorandum was issued to officials in the presence of the former Minister of Public Enterprises, Malusi Gigaba. A representative of the SDCEA had the following to say about the Minister's visit:

> *"He assured us that there will be a proper consultation and public participation process... Unfortunately, to this date, he has disappeared to no surprise along with that statement"– (SDCEA Rep., pers. int., 2014).*

A second protest was held the following year, on 14th November 2013, at the People's Climate Camp in Durban to display resistance toward the DDOP and support for the airport farmers (Fig. 21). Transnet could not be reached for comment on the protest action for this study.

Figure 20: The Airport Farmers Association „Occupy the Durban Dig-Out Port" Protest


*Source: SDCEA Rep., 2014*

Figure 21: People"s Climate Camp Protest


*Source: Hanekom, 2013*

## 5. 2. Dube AgriZone"s Development Phases

### 5. 2. 1. Dube AgriZone: Phase 1

The operational model of Phase 1 of the Dube AgriZone instructs that the future farming platform be administered in a certain way. It characterises the functioning of the agricultural platform by DTPC as Landlord to the Dube AgriZone property which is leased to farmers and producers as the tenants. The objectives of Phase 1 are not only applicable to the first Phase, but they serve to guide future development. The objectives are:

* "To create a cluster of supporting facilities and services (production, research & development, logistics, information, certification, marketing, etc.) to stimulate the growth of high-value perishables sector in KZN;
* To serve as a centre of excellence and a demonstration project for new technology, production methods, training and research in high-value agriculture;
* To act as an incubator for new producers by providing training, mentoring, technical assistance and other support measures; and
* To maximise the opportunity presented by proximity to the airport to stimulate airfreight exports" (VCE [Virtual Consulting Engineers], 2009:10).

Ideal tenants of the Dube AgriZone were considered to be local commercial farmers (and those interested in production diversification into high-end agriculture), perishable production companies, and emerging farmers. From the scoping study outcomes, Phase 1 of the Dube AgriZone would produce high-value vegetables (tomatoes, peppers and cucumbers), mushrooms, cut flowers and plantlets from tissue cultures (VCE, 2009).

In December 2009, DTPC awarded leading Dutch-based companies, Bosch Inveka B. V. (Incorporated in The Netherlands) and its sister company Wilk van der Sande B. V.[36] the contract to design and install the greenhouses and technical components (Motau, 2011; Posthumus, 2011; Certhon & Dube AgriZone, 2012). Although Certhon B. V. were appointed as contractors, they were required by DTPC to use of a team of South African sub-contractors, sub-consultants, labour and other experts, to which they had adhered. Six greenhouses were

[36] Bosch Inveka B. V. and Wilk van der Sande B. V. formed a unified company called Certhon B. V. in 2011.

constructed consisting of technical rooms, boiler rooms, heat storage tanks, ventilation infrastructure (vents and recirculation fans[37]), irrigation facilities, sun-shades and insect screens, carbon dioxide dosing systems[38], sulphur evaporators[39], and high-pressured humidification (fogging) infrastructure all operated by a PRIVA climate-control computerized system (Fig. 22) (Bigala, 2011; Posthumus, 2011; Certhon & Dube AgriZone, 2012; Dhlamini, 2013). Rooftop solar photovoltaic panels (Fig. 23) were installed in the pack-house of Greenhouse C, main Pack-house and Distribution facility and Tissue Culture Laboratory (SESSA [Sustainable Energy Society of Southern Africa], 2011; Dhlamini, 2013). Rainwater harvesting ponds were constructed adjacent to the greenhouses collecting rainwater from the greenhouse roofs (Fig. 24).

Figure 22: PRIVA Climate-Control Computer System


*Source: Fieldwork*

[37] Recirculation fans are believed to decrease energy costs by up to 30% in a Greenhouse (Bigala, 2011).
[38] Carbon dioxide dosing systems function as heating units (Motau, 2011).
[39] Sulphur evaporators serve as energy efficient components extracting sulphur from within the greenhouses keeping energy costs to a minimum (Bigala, 2011).

Figure 23: Solar Photovoltaic Panel Installation at the Dube AgriZone

*Source: SESSA, 2011*

Figure 24: Rainwater Harvesting Pond adjacent to a Dube AgriZone Greenhouse

*Source: DTPC, 2011:50*

This study came across different reasons behind the selection of greenhouse farming for the Dube AgriZone. The DTPC decided to invest in greenhouse farming because the methods of hydroponics would create an annual supply of high-value agricultural produce (Bantwini, pers. int., 2014). On the other hand, a reliable source suggested that the selection of greenhouse farming was due to the outcome of a Dutch-delegation that agreed to the subsidized sale of Bosch Inveka‟s greenhouses by The Netherlands Government to interested parties which DTPC had seized as a business opportunity (Anon, pers. int., 2014).

Before the Dube AgriZone was officially launched, DTPC‟s Strategic Plan acknowledged that: the number of local farmers with experience in intensive agriculture was limited; there were risks involved in sourcing producers skilled in farming with high-tech climate-controlled facilities; and intensive agriculture would require expensive equipment which could influence rental rates to be inflated to recover the input costs (DTP, 2010). DTPC envisioned that producers would initially supply local markets for the first 3 years of their tenancy with the expectation that the bulk of its output will be sold to international markets by the end of a 5 year cycle (DTP, 2010).

During their contract, Certhon found that the tenants had different requirements and goals compared to the landlord which they found challenging to deal with (Certhon & Dube AgriZone, 2012). Although the operational model of the Dube AgriZone was directed at both emerging farmers and established farmers, Phase 1 has only accommodated well-established and highly experienced farming tenants. The reason for this was commented on by the Dube AgriZone Executive, Mr. Mlibo Bantwini:

> *"[Y]ou should try and encourage new entrants as much as possible... but on the other hand you're under pressure to demonstrate success early on so that you can get additional support both from the public sector and the private sector... the model that we chose was to go with experienced companies, because if you are successful in your first phase, it strengthens your case when you want to do a number of developmental projects... you gain momentum, you gain confidence within the stakeholders in the market... and they support your project, whereas with the developmental approach, only where you have a lot of new entrants, the risk of failure is higher... You will struggle to motivate, get funding, and investor confidence goes down. Success breeds success"– (Bantwini, pers. int., 2014).*

Dube AgriZone's current site was former sugarcane farming land (Fig. 25). The site is situated amidst a wetland environment of which 7% of it was lost owing to construction (Fig. 26) (KSEMS [Kerry Seppings Environmental Management Specialists], 2010). A proposed mushroom facility was postponed due to budgetary constraints after the facility had to be redesigned (DTP, 2010).

Before the Dube AgriZone project was established, a Specialist Report by Phatisa relating to the DTP Agricultural Issues was compiled, but the contents of the document were highly confidential and could not be referenced for this study.

Initially this research was sparked by the claim that the Dube AgriZone was South Africa's „future farming platform". Upon enquiry into the statement, the following information was provided:

> *"[I]t's a branding thing that line– future farming– it's a branding thing"– (Bantwini, pers. int., 2014).*

Figure 25: Sugarcane (outlined in yellow) at the Dube AgriZone site prior to Construction


*Source: KSEMS, 2010:8*

Figure 26: Loss of Wetland at the Dube AgriZone Site during Construction (indicated in red)


*Source: KSEMS, 2010:6*

Integral to the operation of Phase 1, has been Woolworths who have procured the majority of the fresh produce grown and processed at the Dube AgriZone. However, the food retailer‟s interpretation of the farming platform‟s future and objectives indicated some concerns for the model:

> *"It is a model that will not solve our food security issues, unless we get foreign investment for all the small scale farmers. That will not happen. South Africa is downgraded every year as an investment destination due to factors like crime, policy, labour unrest and fraud. Investors then look at other African countries, which is happening as we speak, to invest. Angola, Mozambique and Kenya had a good growth in foreign investment for food production, where we saw a decline in investment"– (WW Rep., pers. int., 2014).*

5. 2. 2. Dube AgriZone: Phase 2

To the East of the existing Dube AgriZone, a 92 ha site has been designated for Phase 2 (Map 4). The site is currently occupied by sugarcane plantations with smaller pockets of alien vegetation, natural forest and wetland.

DTPC has assigned SiVEST Environmental Division (Pty.) Ltd. to conduct the EIA for Phase 2 which is currently underway (SiVEST, 2013b). Phase 2 is anticipated to commence with construction by 2015 and it is expected that only a third of the site (an approximate 30 ha) will be initially developed on a temporary basis to be leased for 20 to 25 years to its tenants (Bantwini, pers. int., 2014).

Map 4: Proposed Dube AgriZone Phase 2 Site


*Source: SiVEST, 2013a*

Calls for Phase 2 Proposals at the Dube AgriZone are currently open with invitations for: open-field farming; undercover farming in plastic greenhouses, tunnels, or shaded structures; aquaculture; food processing, packaging and distribution centres; and renewable energy plants (Dube AgriZone, 2013). Companies with intentions to participate in Phase 2 are required to meet the triple bottom line principles:

* Social– The tenant"s support for CSI or promotion of the DTPC"s current CSI initiatives;
* Environmental– Environmentally-friendly and sustainable conduct to be applied throughout the tenant"s operation; and
* Commercial– For Operators to demonstrate sustainable business models (Dube AgriZone, 2013).

Potential tenants will need to develop their operation covering the costs of the development in partnership with DTPC.

With regards to Dube AgriZone"s advancement to Phase 2, the SiVEST (2013c) draft scoping report has stated that: "[b]ased on the production and successful operation of the existing AgriZone it has been identified that expansion of the current facility is required" (SiVEST, 2013c:2). Although DTPC has received proposals for Phase 2, few of them have met the triple bottom line criteria which has been coupled with the ongoing debate about prescriptiveness:

> *"The big debate that"sgoing on internally is, how prescriptive do you get with regards to tenants?... we want to push export markets, that what we"ve been doing, but at the same time you don"twant to be prescriptive to say ,,sdl to this market and not to this market" because if that business fails then they"ll say, ,,wdl DTP, you were the ones that told me I had to export, now this export thing is not going so well""– (Bantwini, pers. int., 2014).*

The reason why the initial development of Phase 2 will be done on a temporary basis is due to the exact site being designated for the second KSIA runway and therefore, the need to ensure that the facilities can be relocated (Bantwini, pers. int., 2014)

## 5. 3. Current Operational Performance of the Dube AgriZone

### 5. 3. 1. Farmwise Marketing (Pty.) Ltd.

Farmwise Marketing (referred to as „Farmwise" from here onward) became a tenant at the Dube AgriZone in February 2013 to operate from the Pack-house and Distribution Centre (Fig. 27) (Payne, 2013). Farmwise"s services include the sourcing, processing, packaging, and distribution of fresh produce from around the country. The company has three customers (Woolworths, Spar and FreshMark) which are in receipt of its wide range of products.

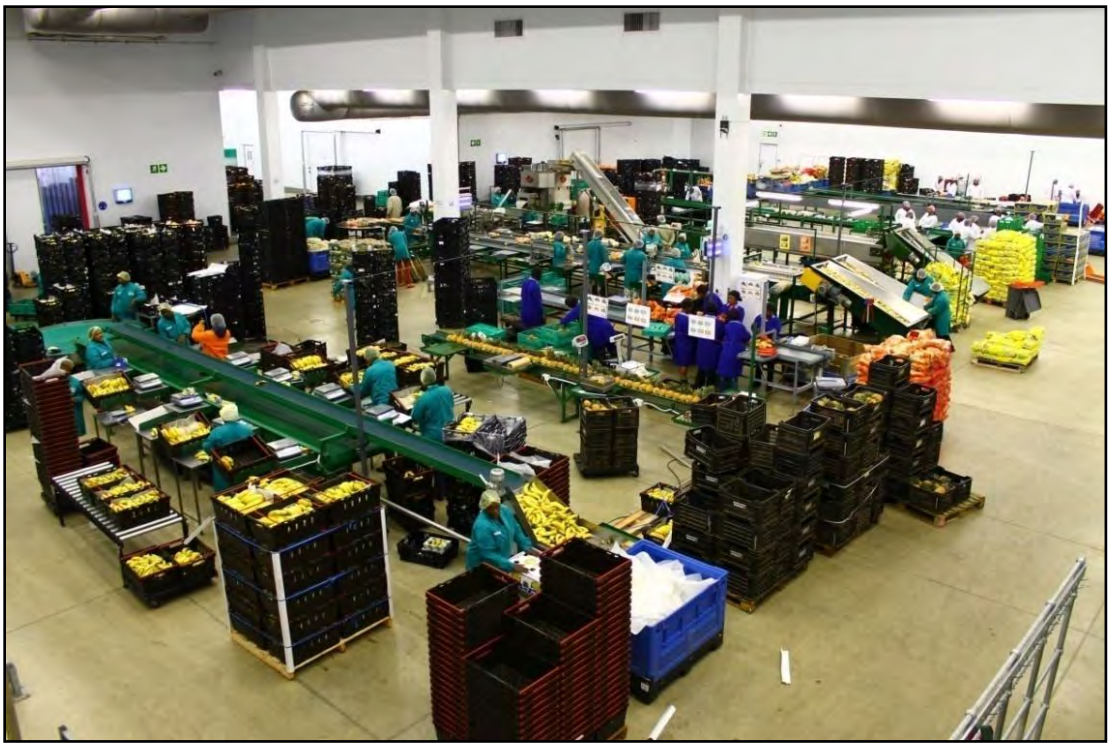
The company decided to operate from the Dube AgriZone for a number of reasons. Being located at the Dube AgriZone reduced the company"s transportation costs in providing its KZN market with produce that was previously trucked-in from Farmwise"s Gauteng-branch. The facility"s solar photovoltaic panels enabled the company to save between R50,000 to R60,000 a month. A banana ripening facility at the pack-house allowed Farmwise to ripen their own bananas, whereas previously the company had to source their banana"s already ripened. A vegetable pre-cut division enabled the slicing of vegetables creating a ready-to-cook product as an added service that Farmwise could provide for the consumer.

Farmwise has been able to create 184 new job opportunities at its Dube AgriZone branch. Employees were first sourced through a labour broker and as their tenancy progressed, local community members applied for vacancies. There were no strict criteria required on behalf of Farmwise to recruit new employees, although preference was given to individuals who had some form of schooling experience and where the language barrier between employer and employee was not severe. Farmwise employees were given in-house training, were informed of the strict in-house health and safety protocol (Fig. 28), and were unionized after being registered under the Food and Allied Workers Union (FAWU).

Throughout this study, Farmwise had expressed their satisfaction in operating with, and from, the Dube AgriZone:

> *"It"s actually quite a pleasure working with them"– (FM Rep., pers. int., 2014).*

Figure 27: Interior of Farmwise Marketing‟s Pack-house and Distribution Centre



*Source: Fieldwork*

Figure 28: Farmwise Employee using the Wash Facility prior to Fresh Produce Handling

*Source: Fieldwork*

During their tenancy, Farmwise experienced minor challenges in terms of ongoing construction during their operation. However, a Farmwise representative (pers. int., 2014) commented that when concerns were raised with DTPC, they were very accommodating and had assisted them.

Farmwise‟s success and satisfaction with their Dube AgriZone tenancy during Phase 1 has been a compelling case for the company to invest in Phase 2 of the agricultural platform (Farmwise Rep., pers. int., 2014). Possibilities of Farmwise exporting produce from the Dube AgriZone were also in the pipeline, but further details could not be disclosed for this study.

Farmwise stated that they were extremely proud of their Dube AgriZone operation enabling them to process good-quality, fresh produce from around the country whilst adopting sustainable practices. The organic waste that accumulates from their operation was collected by DTPC for waste-to-energy conversion and recycling. Farmwise ensured that rejected fruit and vegetables were donated to DTPC to distribute as part of their Food for Recyclables Programme. Farmwise also expressed their willingness to invest in a profit-sharing scheme with their employees to become shareholders in the company and to financially support them in furthering their education.

This study found that Farmwise sources the majority of its produce from outside of the KZN Province with the least amount of its produce being sourced from KZN. Farmwise does not process, package or distribute any of the produce grown by the other Dube AgriZone tenants.

Apparently, Woolworths had influenced the design of the Pack-house and Distribution facility within the Dube AgriZone and were influential in Farmwise occupying the premises. In some cases the Farmwise facility served as a staging platform whereby produce destined for Woolworths, mainly from the Cape regions, arrived at the Dube AgriZone already packaged and simply required Farmwise to label and distribute it to Woolworths stores.

Although Farmwise indicated that they were interested in branching-off into farming their own produce, a representative expressed the unlikelihood of doing so at the Dube AgriZone:

> *"It all sounds fancy and everything... the problem is here with this climate you"ve got, with the humidity, your cooling and your heating costs go through the roof– that"s the problem. Your yields down here drop by about 30%. Just for being down here– even if you control the heat– 30%. You can do it right, but it costs much more money… which doesn"tjustify your cost you"ve put in there. Then you might as well close your doors... Natal, where we are here now could work, but its not favourable. That"s why I would not grow where we are now here. Climate-wise, it"s a disaster. I would rather they plant it up in the Transvaal somewhere because the climate is perfect up there"– (FM Rep., pers. int., 2014).*

Despite this comment, Farmwise were satisfied with their operation at the Dube AgriZone, were of the opinion that DTPC were extremely helpful landlords, and that the agricultural platform was definitely a sustainable farming venture.

5. 3. 2. Qutom Farms (Pty.) Ltd.

Qutom Farms (referred to as Qutom from here onward) secured their tenancy at the Dube AgriZone during April 2010. Qutom would offer their 37 years of expertise in hydroponics farming to grow varieties[40] of tomatoes, cucumbers and peppers for customers Woolworths and FreshMark (Fig. 29).

[40] Varieties of each produce consisted of Rosa and regular tomatoes, English and Mediterranean cucumbers, and red, yellow and green peppers.

Figure 29: Interior of Qutom Farms" Greenhouse with Vertically Growing Hydroponic Produce

*Source: Fieldwork*

Prior to their lease at the Dube AgriZone, Qutom Farms had to truck fresh produce from their Gauteng-based farm to their KZN market (Joubert, 2013a). It appears that Woolworths had suggested the Dube AgriZone site to Qutom as a potential farming venture on which they commented:

> *"We knew about project, but didn"t actively pursue it"–*
> *(QF Rep., pers. int., 2014).*

A final decision was made which resulted in Qutom signing a 15 year lease contract[41]. This enabled Qutom to regionalize their supply to the KZN market and reduce their transportation costs.

[41] The 15 year lease is a 10 year lease with an automatic option of a further 5 years (QF Rep., pers. int., 2014).

Qutom grew its produce hydroponically using Dutch-imported Coco peat[42] slabs (Fig. 30) and purified rain-harvested water. Plants were tied with string to the floor-to-roof wire enabling them to grow vertically, with employees using mobile elevation trolleys to reach the topmost produce (Fig. 31). Harvested produce were collected and packaged for the clients by Qutom‟s own pack-house facility (Fig. 32). If there was any surplus produce, it was generally a small percentage and was sent to the Durban Fresh Produce Market.

Figure 30: Hydroponic Farming System with nodes inserted into Coco Peat slabs providing Nutrients to Plants


*Source: Fieldwork*

[42] Coco peat is a by-product of the coconut industry.

Figure 31: Qutom Farms Employee tying a Cucumber Plant whilst on a Mobile Elevation Trolley

*Source: Fieldwork*

Figure 32: Qutom Farm‟s Pack-house Facility

*Source: Fieldwork*

Qutom was able to create 150 new job opportunities for people (mostly female) from the surrounding local communities with no prior skills or work experience and trained them on how to work in a hydroponics farming facility. Additionally, Qutom contributed to the Food for Recyclables Programme by donating some of its produce.

This study found that currently, Qutom only produces cucumbers and a few herbs, and has stopped producing tomatoes and peppers evident from a now empty Greenhouse A. Upon enquiry, the following information was provided:

> *"The reasoning is where it gets controversial. The greenhouses were originally set up to grow cucumbers and tomatoes. The tomatoes do not do well on the coast... The main reason that we have a problem here, is that first of all, humidity is relatively high... it affects the way the plants grow. But the biggest problem is that for a large percentage of the year, for the summer season… the diurnal difference is very narrow. And tomatoes need a decent diurnal difference. And sometimes here we have a 3 or 4 degree diurnal difference which is just not enough for good pollination"– (QF Rep., pers. int., 2014).*

Whilst taking photographs of Qutom‟s greenhouse interior, it became apparent that the company had been using an imported biological control agent supplied by a company called Koppert Biological Systems[43] suggesting a prevalent pest issue (Fig. 33). Although the company admitted to only growing cucumbers, tomatoes (Fig. 34) and a pepper (Fig. 35) were found growing in a single row of Greenhouse C.

[43] Koppert Biological Systems B.V. is an international company based in The Netherlands specialising in biological crop protection and natural pollination (Koppert, n.d.).

Figure 33: Koppert Biological Systems Control Agent Attached to a Cucumber Plant


*Source: Fieldwork*

Figure 34: Tomatoes Found growing in Greenhouse C

*Source: Fieldwork*

Figure 35: A Green Pepper Found Growing in Greenhouse C

*Source: Fieldwork*

Qutom raised an issue that the greenhouses lacked effective cooling capabilities:

> *"These greenhouses are climate controlled, but there"s no cooling facilities effectively on them... We"ve tried for almost 2 years to get it right. We just haven't been able to do that"– (QF Rep., pers. int., 2014).*

When asked whether the issue was raised with DTPC, the response given was:

> *"Look, they all know about it. I mean the problem is that it"s a cost implication. We haven't even gotten down to that. For now we"re just looking at what the cheapest option would be"– (QF Rep., pers. int., 2014).*

Rhino Agrivantage, a local company involved in the construction of the greenhouse facilities were contacted for this study, and a representative made the following statement when asked about the apparent absence of effective greenhouse cooling mechanisms:

> *"There is cooling installed... The cooling system is comprised of a fogging system which is installed well above the crop... This allows for rapid cooling with the circulation fans in the greenhouse... Screens are used to lower the incoming solar radiation. The farmer could also use the carbon dioxide to increase photosynthetic rate and thereby reduce stress...This technology is installed, but is not employed by the grower"– (RA Rep., pers. int., 2014).*

In April 2012, an article surfaced within *The Mercury* newspaper that Dube AgriZone‟s produce was flooding the local markets and threatening the livelihoods of local vegetable farmers and farm workers in the KZN Province (Naidoo & Mkamba, 2012). Apparent job losses and farm closures were reported amongst farmers who were angered by the farming platform and accused it of being a Government-subsidized venture competing unfairly with local farmers. Qutom Farms produce had supposedly saturated the Durban Market resulting in farmers having to seek alternative markets.

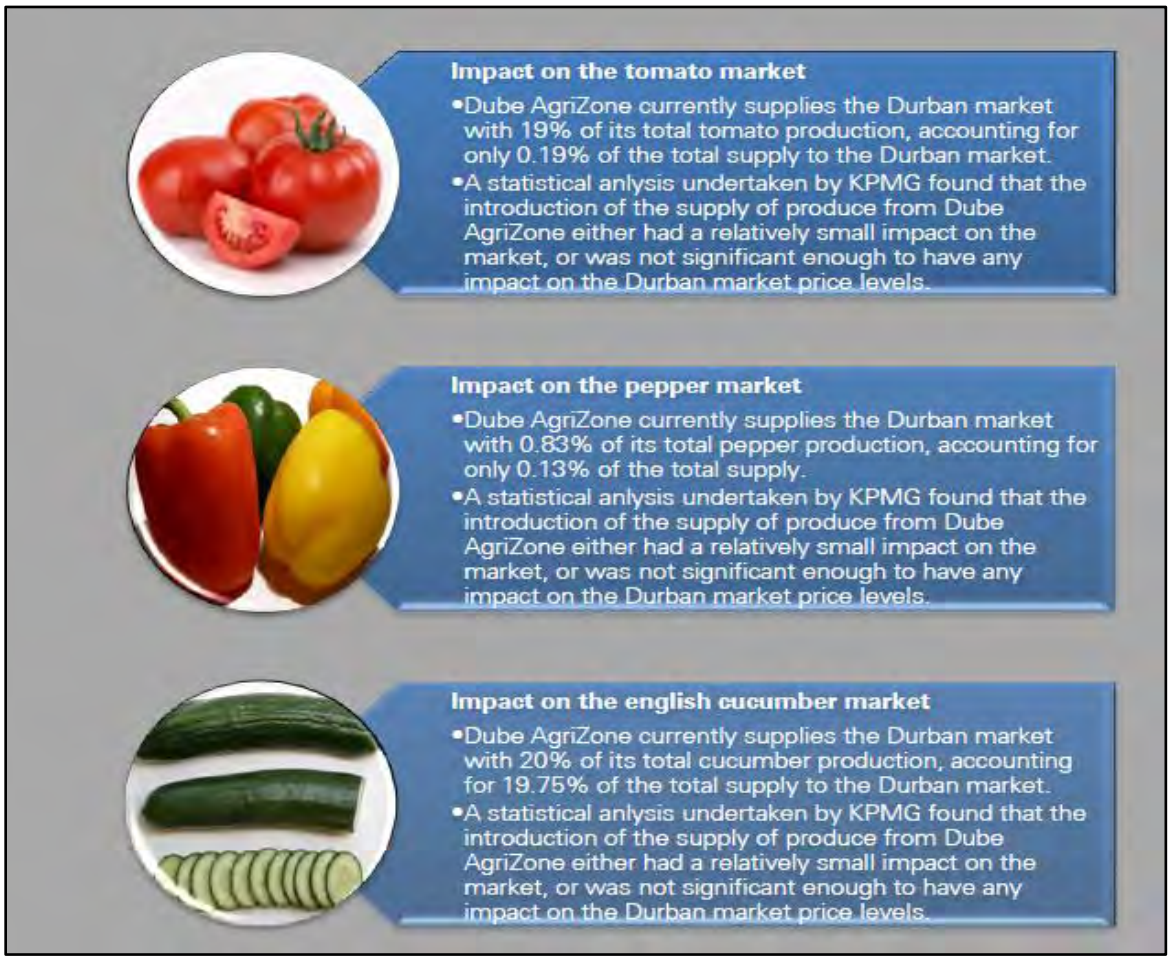
The article mentions that the KwaZulu-Natal Agricultural Union (Kwanalu) had received a number of complaints from farmers in the region. An attempt was made to interview Kwanalu but they declined to participate in this study, and thus the claims could not be verified. Qutom was well aware of *The Mercury* article, and when asked about the KZN farmer‟s claims, gave the following response:

*"They"retalking b******t. This is where people have been getting the misconception. I had a market in KZN already, before I even came here. Because I was supplying Woolworths KZN from Johannesburg... To be honest, there"sa lot of sour grapes about, „Iam here"and „I'mnot local". I came from out of the province to farm the operation– yes I did. But if the truth be told, the locals were offered it, and nobody wanted it"– (QF Rep., pers. int., 2014).*

The Dube AgriZone Executive offered some insight into the repercussions of the article. DTPC subsequently commissioned a KPMG study to investigate the impact that each of Qutom"s products were having on the Durban market, if any. The KPMG study found that all three product lines had a relatively small to insignificant impact on the Durban market (Fig. 36) (KPMG, 2012). The Dube AgriZone Executive commented on the issue as follows:

*"We took those views very seriously because the last thing we wanted to do is to have a negative impact on the local industry... what we found with the produce that"s being grown here is that there was minimal impact... Actually, there have been other farmers who have been saying, „you guys have got this climate-controlled facility, we are out of the market because winter temperatures have dropped, we don"thave the same production yields, but we know you"ve got volumes– can you please supply me with some of the product so that I can fulfil my order with my client?".So in some instances it had actually assisted other farmers!... But the statistics are there.... I think people found a scapegoat and they latched onto that scapegoat"– (Bantwini, pers. int., 2014).*

Figure 36: Info-Graphic of the Micro-economic impact of Dube AgriZone‟s Produce on the Durban Market




*Source: KPMG, 2012*

Qutom had exposed its concerns about the Dube AgriZone‟s objectives, model, and administration in line with their own agribusiness ideology. Qutom expressed the difficulties in South African greenhouse farming with intentions to export to European and Middle Eastern markets as per Dube AgriZone‟s objectives:

*"Since the development of the EU [European Union]… Britain and Holland, were producing product for Europe during their summer... they set up companies in Spain to produce during winter. So that window of opportunity closed to a large degree. So where we could have exported it during their winter, our summer, that window is almost closed now... if you look at getting product from here to Dubai, this place (Dube AgriZone) is still further away and more expensive than getting product out of Europe to Dubai... you can never export without having a fairly substantial local market. And because everyone thought, well we"regoing to be close to the airport, it"sgoing to be cheap to get product there– it"s notcheap, it"sexpensive!"– (QF Rep., pers. int., 2014).*

Qutom expressed that they wished that local farmers were included in the Dube AgriZone project right from the beginning in order to contribute their knowledge and expertise on the agricultural prospects and limitations for the region. Qutom has not had any discussions with DTPC on whether they intend to pursue farming in Phase 2 or not. Whatever the intentions that Qutom has in mind, the stance on their prospective operation was made clear:

*"I feel that feeding our own nation is more important than feeding another nation"– (QF Rep., pers. int., 2014).*

5. 3. 3. Carmel Nurseries [c. c.]

Carmel Nurseries (referred to as „Carmel" from here onward) commenced their tenancy at the Dube AgriZone in 2012 (Fig. 37). Carmel had arranged to operate from Greenhouse D to produce 30,000 Curcuma *alismatifolia* flowers per week during the months of October to March as per a R10,6-million annual export-procurement contract for KP Holland in Amsterdam. The flowers were air-freighted by Air Emirates from KSIA to Schiphol International Airport via Dubai (Naidoo, 2013). Carmel, who were corporate-affiliated with KP Holland, had been

assisted by DTPC in securing the export contract. Once finalized, Carmel began to plant the Thai Tulips in July 2012 with 62 newly-employed local individuals (West, 2013; CN Rep., pers. int., 2014).

Figure 37: Interior of Carmel Nurseries‟ Greenhouse at the Dube AgriZone

*Source: DTPC, 2014a*

This study found that Carmel Nurseries has had their Dube AgriZone contract terminated and does not operate from the Dube AgriZone any longer[44]. Carmel was given formal notice to vacate the Dube AgriZone premises on 9th January 2014 and they are currently in a court-battle with DTPC (CN Rep., pers. int., 2014).

[44] As of this thesis statement, this fact is completely absent within the media apart from a „Call for Proposals‟ advert for Greenhouse D in the Documents tab of the DTP Website (see Appendix 1).

Before Carmel‟s tenancy began, a South African flower producing company called LIV Flowers was initially due to occupy Greenhouse D (Joubert, 2011). It was found that LIV Flowers had cancelled their tenancy plans at the Dube AgriZone to grow cut-flowers for the following reasons:

> *"The cut-flower market in South Africa is too small to absorb an extra 4 ha of supply, so a condition of mine signing for a lease was that Dube find an export market at the political / diplomatic level. The CEO agreed to this but did not deliver on the promise"– (LIV Rep., pers. int., 2014).*

LIV Flowers‟ perception of the Dube AgriZone project overall, was described as follows:

> *"The intentions and raison d'être are very good and noble, but the execution and implementation has been controlled by politicians and not industry experts. The result has been a very negative perception in the industry about the project and a resistance to a large degree to cooperate with Dube"– (LIV Rep., pers. int., 2014).*

Eventually LIV Flowers abandoned their tenancy at the Dube AgriZone after finding the project‟s risks outweighing the benefits.

Carmel had experienced difficulties early into their tenancy. Greenhouse D was supposedly specifically designed to produce Anthurium flowers, but the demand in South African markets were said to be minimal. However, Carmel‟s business associate KP Holland was willing to procure Curcuma *alismatifolia* if it were to be grown at the Dube AgriZone. It is alleged that DTPC reacted by converting Greenhouse D for the growth of Thai Tulips, at an apparent cost incurred by DTPC of 1,6-million Euros (CN Rep., pers. int., 2014). The R10,6-million annual export contract was subsequently procured and was the Dube AgriZone‟s first export contract to be established with a tenant.

In order to produce the Thai Tulips, Carmel were required to stock the greenhouse by importing plant rhizomes (developed in Thailand and cultivated in Brazil) from KP Holland at an estimated cost incurred by Carmel of R1,5-million (eNCA [eNews Channel Africa], 2013)[45].

Carmel‟s first season commenced in October 2012 and had encountered much difficulty. Carmel had only managed to sell approximately 200 Thai Tulips over the entire 6 month first season as opposed to the 30,000 plants that it was meant to sell on a weekly basis for 6 months. The reasons behind the production difficulties were due to issues of logistics, infrastructure and finances.

KP Holland provided photographic evidence to Carmel that their product was arriving in a bad shape (Fig. 38 & 39). Flower stems were damaged, petals were browned, boxes were leaking with water, and on some occasions the product was delivered upside down. Although cargo handlers were given instructions on how to handle the cargo whilst in transit, neither Carmel nor DTPC had any control over Air Emirates‟ cargo handling. KP Holland soon displayed disinterest in the Dube AgriZone product. This study attempted to contact KP Holland on multiple attempts but received no response.

[45] Video 5: https://www.youtube.com/watch?v=urc6jhIamfw (eNCA, 2013).

Figure 38: Carmel Nurseries Curcurma Flowers Arriving to KP Holland in Bad Shape

*Source: CN Rep., 2014*

Figure 39: Carmel Nurseries‟ Curcurma Flower Boxes Leaking with Water

*Source: CN Rep., 2014*

Greenhouse D did not have any solar photovoltaic panels on its roof owing to the tenant‟s high electrical bills. Carmel had revealed that Greenhouse D did not have the infrastructural capacity to be cooled down. The greenhouse ceiling curtains meant to shade the interior would apparently suppress air-flow in the greenhouse causing heat levels to rise. Greenhouse roof vents could not be opened either because of the effects caused by atmospheric soot:

> *“[T]he surrounding sugarcane farmers burn the sugarcane. All the soot comes through the greenhouse windows and it ends up on your flowers... staining the flowers black! There‟s moisture around and it melts– it‟s like somebody had sprayed a black can of paint... You‟ve got the Californian Thrips that live in the sugarcane. As soon as they start burning the sugarcane... they enter the greenhouse via the vents and settle themselves in your cultures. Now we couldn‟t put an anti-virus screen on the vents... as soon as you do that you restrict the air flow of your greenhouse by 60%.”– (CN Rep., pers. int., 2014).*

The Development Executive of THD, Mr. Greg Veerasamy, did admit to sugarcane burning by THG farmers and emphasized that it was controlled with ACSA according to the wind direction from an aviation-safety aspect, but did not mention any awareness of its effects on Carmel‟s produce (Veerasamy, pers. int. 2014). As a result, Carmel had to invest in Koppert chemicals to control and kill the insects. The combination of all these factors positioned Carmel in a state of rental and service arrears, in which they had informed DTPC.

In a mitigatory attempt, Carmel resorted to planting varieties of ornamental plants to generate a flow of income. Woolworths and Pick „n Pay (Pty.) Ltd. were secured as clients with the former in negotiations with Carmel to secure a R300,000 monthly contract to purchase roses. Carmel also resorted to the sale of 51% of the company shares to a South African agricultural company and were placed under due diligence (CN Rep., pers. int., 2014).

DTPC stepped in and travelled to The Netherlands with Carmel to meet with KP Holland. Thereafter, DTPC‟s CEO apparently gave Carmel three options in moving forward, which would also assist if the transaction of shares did not take place:

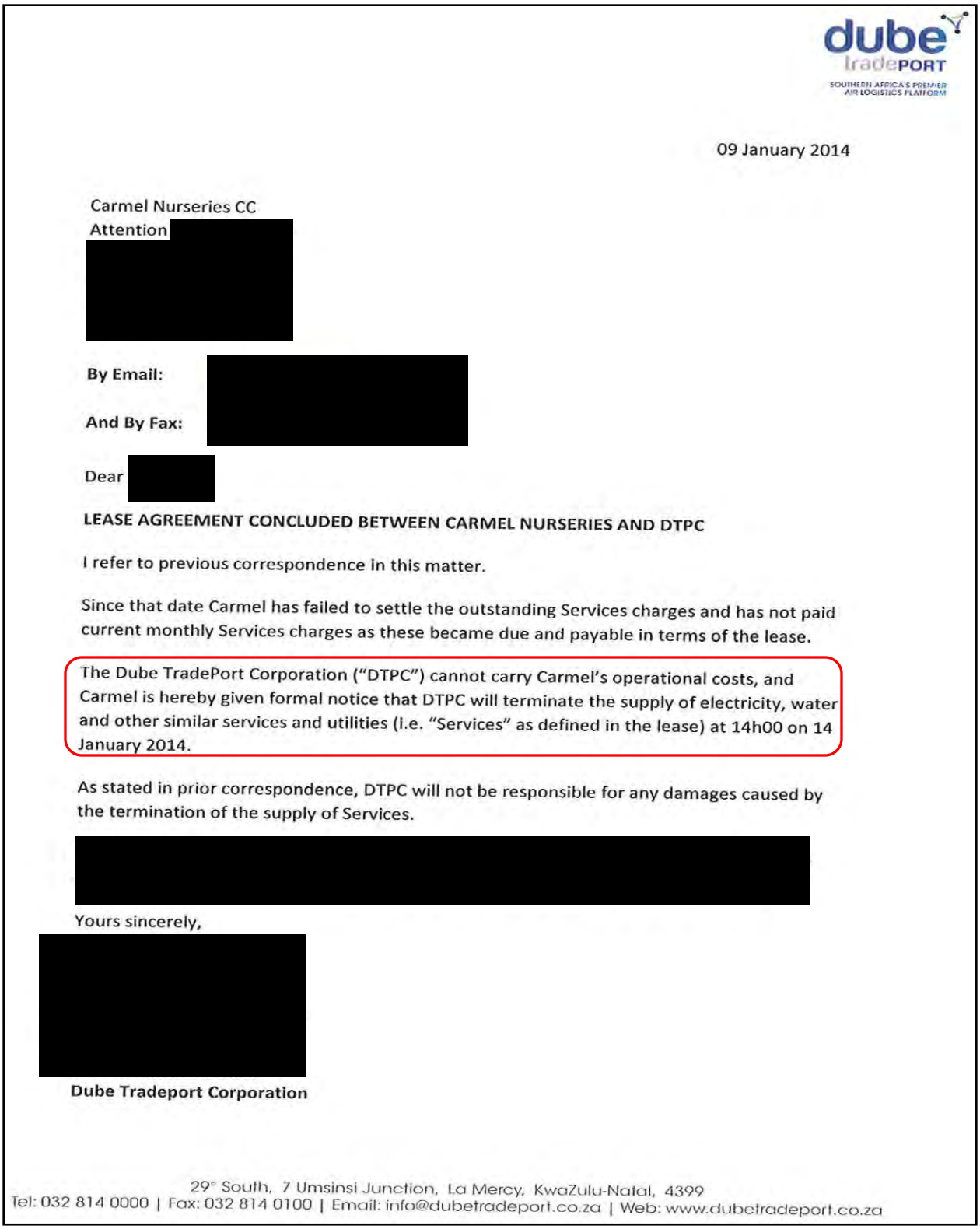
1. Carmel would be offered a cheaper greenhouse in Phase 2;
2. DTPC would enter into a JV with Carmel. Carmel would be able to buy back the shares that would be transferred to DTPC when the business had stabilised on a profitable basis; or
3. That the arrears would be written off and that Carmel would start over with a clean slate (CN, 2013a).

DTPC‟s CEO did not agree to participate in this study, therefore the suggestions above could not be confirmed.

On 13th December 2013, DTP sent Carmel a „Breach of Lease Agreement‟ letter and were given 10 days to remedy the finances in arrears. However, it was not enough time for Carmel and although the shares transaction was in progress, there were no indications from Ithala Development Bank on its finalization. As a result, Carmel resorted to the three alternative options, but in their communication DTPC had agreed that the options were provided, but on an informal basis. As there were no other alternative options, Carmel issued a letter to DTPC stating: “Unfortunately, we have no other option at this time but to shut down our operation here at the AgriZone” (CN, 2013b).

Staff retrenchment letters were handed out to Carmel‟s Dube AgriZone employees on 20th December 2013, and on 9th January 2014 DTPC issued Carmel Nurseries with a formal notice to vacate the Dube AgriZone premises (Fig. 40). With a greenhouse full of its product, Carmel had to dump R1-million worth of its produce because a last-minute buyer could not be secured as it was holiday season.

Figure 40: Carmel Nurseries‟ Formal Notice to Vacate the Dube AgriZone



dube tradePORT
SOUTHERN AFRICA'S PREMIER AIR LOGISTICS PLATFORM

09 January 2014

Carmel Nurseries CC
Attention [redacted]

**By Email:** [redacted]

**And By Fax:**

Dear [redacted]

**LEASE AGREEMENT CONCLUDED BETWEEN CARMEL NURSERIES AND DTPC**

I refer to previous correspondence in this matter.

Since that date Carmel has failed to settle the outstanding Services charges and has not paid current monthly Services charges as these became due and payable in terms of the lease.

The Dube TradePort Corporation ("DTPC") cannot carry Carmel's operational costs, and Carmel is hereby given formal notice that DTPC will terminate the supply of electricity, water and other similar services and utilities (i.e. "Services" as defined in the lease) at 14h00 on 14 January 2014.

As stated in prior correspondence, DTPC will not be responsible for any damages caused by the termination of the supply of Services.

[redacted]

Yours sincerely,

[redacted]

**Dube Tradeport Corporation**

29° South, 7 Umsinsi Junction, La Mercy, KwaZulu-Natal, 4399
Tel: 032 814 0000 | Fax: 032 814 0100 | Email: info@dubetradeport.co.za | Web: www.dubetradeport.co.za

*Source: CN Rep., 2014*

This study found that the Dube AgriZone had developed a stigma amongst the South African horticultural industry. One of the country‟s horticultural product procurement agencies, Plantimex Group (Pty.) Ltd., made the following comment in relation to the Dube AgriZone‟s operation:

> *"I do not agree with the business principles of the AgriZone however, as this venture is largely subsidized by the state and competes with local businesses unfairly. I will not shy away from expressing my thoughts regarding this business model and will not support procurement from this facility"– (Plantimex in conversation with CN Rep., pers. int., 2014).*

Carmel experienced further difficulty in selling their product to the Gauteng market due to an apparent non-procurement clause arranged between Plantimex and DTPC, completely unaware to Carmel at the time. Further product alienation ensued as other horticultural groups in support of Plantimex‟s actions followed suit placing Carmel in a dire situation.

Not only did Carmel have to cease their operation at the Dube AgriZone, but Carmel Nurseries had to shut down their business on 7th March 2014 after investing almost R7-million to save their Dube AgriZone operation which financially exhausted the business:

> *"Carmel was thus left isolated without any support from the industry at large... The hard fact is that it is as a direct result of our tenancy at the DTP that we were forced to close down the operation. The industry at large does not support the AgriZone and fears are that it will harm the horticultural industry in the same way as DTP and Qutom harmed the local producers of tomatoes and cucumbers"– (CN Rep., pers. int., 2014).*

Dube AgriZone had invested an approximate R500,000 to produce an advert (see Video 2) showcasing Carmel"s export contract (Anon., pers. int., 2014). When the Dube AgriZone Executive was asked why the end of Carmel"s operation was not expressed to the media, the following response was given:

> *"It"s a very confidential subject because there are certain processes that are unfolding, so I would not like to delve into those"– (Bantwini, pers. int., 2014).*

Carmel"s final thoughts on the Dube AgriZone and their experience were conveyed as follows:

> *"I am not going to the press with this. What do I stand to gain out of this other than being vindictive?... The DTP is what it is. AgriZone is what it is. It"s an incredibly difficult, harsh place to go and farm... I don"t think that Natal is ready for the AgriZone... Qutom is next to close down. It"s just a matter of time. Their tomatoes and peppers were a failure… DTP does not have any expertise in agriculture whatsoever… I have no desire to be at DTP anymore"– (CN Rep., pers. int., 2014).*

5. 3. 4. Dube AgriLab

The Dube AgriLab is a micro-propagation[46] plant-tissue culture facility at the Dube AgriZone. The laboratory propagates young plantlets from tissue culture material and has the capacity to produce 5 million disease-free plantlets per annum. The aim of Dube AgriLab is to service the plant propagation needs of the agricultural and horticultural industries in both local and international markets.

[46] Micro-propagation is a process of extracting plant tissue (the explant) from a plant (the parent plant) and growing it in an artificial medium for it to develop into a small plant to continually produce more plantlets on an exponential basis.

This study found that Dube AgriLab serviced a Dube AgriZone tenant (Carmel Nurseries) and other local and international clients. Dube AgriLab works with the South African Sugarcane Research Institute (SASRI) in a NovaCane® Project producing a selective range of NovaCane® varieties for commercial sugarcane farmers. NovaCane® varieties were exported to sugarcane farmers in Nigeria as part of a Dube AgriLab export contract (DTP, 2014g). The Dube AgriLab is in the process of conducting research to determine its capability of producing Macadamia nut, Eucalyptus, Pine tree, and banana plantlets as well as bamboo shoots for biomass.

This study found that during Dube AgriLab‟s initial stages, the facility had to be redesigned after a tender was not awarded to any company to facilitate the operation. Details on the costs and reasons toward its redesign could not be found. Surprisingly, the sugarcane farmers in Nigeria who were importing NovaCane® varieties from the Dube AgriLab were former South African sugarcane farmers (Bantwini, pers. int., 2014). This study had also found that although the Dube AgriLab had propagated plantlets for growth by Carmel Nurseries, their plants would die 2 to 3 weeks later. It was also more expensive for Carmel Nurseries to purchase the ornamental plantlets from Dube AgriLab than from KP Holland (CN Rep., pers. int., 2014).

### 5. 3. 5. Dube TradePort‟s Corporate Social Investment

DTPC have invested in social upliftment, food security and empowerment initiatives. DTPC‟s „Food for Recyclables‟ programme was initiated in October 2012 and involved the trading of recyclables (cans, papers and plastics) with schools within the La Mercy area (Trubel, La Mercy, Blackburn, and Sarasvati Primary Schools) in exchange for produce grown and processed at the Dube AgriZone (cucumbers, tomatoes, peppers, and Farmwise‟s fruit and vegetables) (Fig. 41 & 42). The programme was administered by members of DTPC staff on each Friday of every month. The conversion of recyclables for food was kept simple with all pupils receiving the same amount of fresh produce no matter the amount of recyclables collected (Dube CSI Rep., pers. int., 2014).

Figure 41: Food for Recyclables Programme taking place at a School with Learners Trading Recyclables in line before collecting Fresh Produce

*Source: Dube CSI Rep.*

Figure 42: Learners in line to collect Cucumbers and Peppers

*Source: Dube CSI Rep.*

DTPC have also engaged toward developing a worker empowerment scheme for its Dube AgriZone employees to share in the benefits of the agricultural project. DTPC has sought the expertise of Cape Town-based consultancy, Phuhlisani Solutions, to develop the worker empowerment scheme for the Dube AgriZone employees (Phuhlisani Solutions, 2012).

This study has found that the Food for Recyclables programme has been postponed since April 2014 due to an inconsistency of fresh produce supply from the Dube AgriZone. It was indicated that alternatives were being investigated on how to administer the programme effectively with intentions to rely upon fresh produce grown by female farmers in rural KZN instead and providing the schools with produce on every alternative Friday (DTPC CSI Rep, pers. int., 2014).

It was found that the worker empowerment scheme for Dube AgriZone employees has not been implemented. A representative of Phuhlisani Solutions was contacted for this study and commented:

> *"[Laughs]… That worker empowerment scheme? It completely fizzled out. We haven't heard from the DTP ever since"– (PS Rep., pers. int., 2014).*

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CHAPTER 6: Research Reflections

This chapter reflects on the findings of this research. This chapter discusses the findings of the insights of the DTP development and agricultural activity at airports, the motives behind the Dube AgriZone Phase-frameworks, and the performance of the Dube AgriZone operation. The chapter concludes with a section that describes the Dube AgriZone operation in terms of the researcher‟s findings and research experience.

## 6. 1. Insights into the Dube TradePort‟s Development and Agricultural Activity at Airports

### 6. 1. 1. The Dube TradePort

La Mercy‟s airport was intended by the State to focus on a passenger-traffic airport. It was not until the Schiphol Group and AECOM-McClier Corporation studies that National Government had decided to proceed with it as an aerotropolis development. Aerotropolis:KZN and its DTP airport-city is, therefore, an internationally influenced aerotropolis development which indeed confirms Kasarda‟s (2000) view that aerotropoli are a global phenomena.

DTP was initially conceptualized as a PPP with a project cost of R1,370-billion. However, National Government decided to proceed with the project under non-PPP procurement methods at a new project cost of R8-billion, thereby obligating ACSA as the DTP‟s equity partner which insured the DTP as an entity fully-owned by the State. In this case, the DTP is an exception to Freestone (2009) and Gillen‟s (2011) interpretation of airports and their developments loosening ties with the State.

This study found that ACSA had no intention at the time of Government‟s decision to relocate the city‟s main airport to La Mercy. ACSA had to contribute R6,8-billion to the DTP development which they believe would have cost them much less if they had time to perform research and were not pressurized to build KSIA in time for the 2010 FIFA Soccer World Cup. Before KSIA was built, it appears that ACSA was already in debt of R8-billion from other airport developments and had to pass on the costs to construct KSIA to the consumer by increasing airport taxes (Robbins, 2014). As shown by other researchers (Appold & Kasarda, 2011), an aerotropolis development can benefit from the additional revenue generated from non-aeronautical components (in this case, the DTP components) subsidizing the aeronautical

component (in this case, KSIA). However, in relation to the DTP, the non-aeronautical components were only launched in 2012– two years after the aeronautical component had been launched in 2010. This indicates that KSIA could not benefit financially from the revenue generated from DTP‟s components because they were not established in time to cross-subsidize the airport which could have decreased the costs incurred by ACSA and that of its consumers.

Although there was considerable effort to create a world-class air transportation facility, some of KSIA‟s employees struggle to access it by means of public ground transportation which ACSA believes is extremely inefficient and insufficient. ACSA has subsequently resorted to providing a transportation service to its employees who would normally rely on public transportation. This portrays the DTP as a state-of-the-art air logistics platform with an inefficient public ground transportation system.

The KSIA runway does lie opposite the Barn Swallow roosting habitat. Although Schmidt and Seamans (2013) and Blackwell *et al*. (2009) consider these wildlife refuges as hazardous to airport activity, the Specialist studies had proved that the Barn Swallow population could harmoniously co-exist with the airport and, therefore, posed no major risk. However, the DTP State of the Environment Report (2011) contains conflicting information stating that the airport and its surroundings will become more attractive to birds once construction takes place. Therefore, discrepancies concerning the presence and impacts of birds around DTP are clearly apparent. This research recommends a reinvestigation into the impacts of birds and other wildlife near DTP.

### 6. 1. 2. Agricultural Activity at Airports

Agricultural activity at the former DIA site was an unexpected finding of this research. AFA remain uncertain of what the future holds for their livelihoods. Although it made sense that the decision to sell the DIA site was between landlord and buyer, there were inconsistencies amongst the interviewees on whether and exactly when each party had communicated the sale. ACSA must be commended for their initial efforts to assist AFA in finding an alternative farming site in the event that the DIA site was sold. However, once the property was sold to Transnet, ACSA had abandoned their efforts believing the issue was Transnet‟s responsibility.

Transnet appear reluctant to discuss the future of the airport farmers– SDCEA, AFA and this research have first-hand experience of Transnet‟s unwillingness to provide information. If the DDOP is to commence with construction by 2016, the airport farmers have less than two years to fight for their land or find an alternative. The suggestion by ACSA to assist the airport farmers to find employment at the DDOP has been portrayed as absurd (Moolla & Paruk, 2009). It would be a grave matter of social injustice for AFA to be evicted from their farmland and have their only means of livelihood taken away from them without compensation. Despite AFA‟s efforts to protest against their eviction, this research finds that the DDOP will most likely triumph. It is a matter of sixteen farmers providing fresh produce for the Durban region versus a development that will employ 20,000 people (with 47,000 more during construction) and contribute an annual R56-billion to the country‟s GDP.

The attorney who represented AFA and suggested that they be given the opportunity to farm at the Dube AgriZone must be commended. Although DTPC had to decline the request having secured tenants for Phase 1, this research questions why the farmers were not given an opportunity to farm during future Phases? Phase 2 of the Dube AgriZone has open calls for open-field farming. AFA are open-field urban agriculturalists who could be given the opportunity to farm during Phase 2. However, the Dube AgriZone is much further away from where most of the farmers live in the South Durban region and this might be problematic on their behalf for maintaining a sustainable livelihood.

### 6. 2. The Dube AgriZone Phases: Plans and Motives

This research found the Dube AgriZone‟s framework to be very ambitious. The reason why greenhouse farming was invested in differed according to two of the study‟s interviewees. The Dube AgriZone Executive suggested that it would allow for a continuous supply of high-value fresh produce with greater yields to penetrate both domestic and international markets. Conversely, an anonymous interviewee suggested an alternative motive that the greenhouses were chosen because they were subsidized by The Netherlands government providing cheap access to parties interested in exploiting the emergent market of high-end perishable goods. The Dube AgriZone Executive did not mention during the interview that the greenhouses were subsidized.

DTP‟s (2010) Strategic Plan documented the projected limitations of high-tech greenhouse farming for the region as: having limited local commercial farmers with expertise in intensive agriculture; involving huge risks in trying to secure producers skilled in high-tech climate-controlled agriculture; and being expensive with projected rental inflation for tenants. However, high-tech greenhouse farming was pursued anyway which could be interpreted as an unrelenting optimism for the farming venture.

DTPC successfully secured Certhon to design and construct the Dube AgriZone greenhouses. However, Certhon experienced delays and found the project challenging because of the different goals and requirements from both tenants and landlord. This challenge could have been avoided if there was better communication and planning between the landlord and tenants on a single agenda incorporating a holistic vision on the preferred type of agricultural establishment prior to the project‟s execution. This was what de Janvry and Sadoulet (2010) recommended in theory as suitable for African agricultural establishments.

Phase 1 of the Dube AgriZone consisted of experienced farmers considered as ideal tenants. According to the Dube AgriZone Executive, experienced tenants were selected for Phase 1 to demonstrate the project‟s success in its initial stages which would lead to early investment through gaining investor confidence and allowing the Dube AgriZone to gain momentum for the future Phases. Furthermore, the Executive believed that if new farming entrants were chosen the rate of failure would have been higher making it difficult to gain investor confidence and funding. This study has shown that both of the highly-skilled farming tenants experienced difficulties to the point whereby the Dube AgriZone had lost one of its farming tenants. Although aiming to initiate early investment into the farming facility by using experienced commercial farmers, this tactic may have backfired on the Dube AgriZone. Perhaps the project has placed too much focus on securing investment for the Dube AgriZone as opposed to ensuring the viability of the agricultural facility which would naturally induce investment as an outcome of its feasibility. Dube AgriZone should shift its focus toward mastering the techniques of high-tech climate-controlled greenhouse agriculture in order for its commercial farming tenants to enhance the performance through application of their own farming knowledge. If Dube AgriZone were to succeed in this respect, the operation could claim to be a farming platform for the future as a genuine condition, as opposed to a marketing slogan.

The agricultural issues related to the development of the Dube AgriZone were found to be strictly confidential and could not be disclosed within this study. Arguably, the Specialist Report by Phatisa should be publicized because the Dube AgriZone is a public investment and this information should not be withheld from the public.

This research showed that the Dube AgriZone site is located within the vicinity of an existent wetland. Seven percent of the wetland environment was destroyed during the construction process. With regards to agricultural activity at the Dube AgriZone in such close proximity to KSIA, it could be argued that the Dube AgriZone farming platform does not pose any risks to bird, insect or other wildlife attraction because its farming takes place indoors enclosing it from the external environment. However, the site has maintained 93% of the present wetland and contains three water retention ponds. Blackwell *et al.* (2009) consider such features as hazardous to airport activity because of their potential to attract birds, insects and other wildlife. Furthermore, Phase 2 of the Dube AgriZone is projected to incorporate open-field farming and aquaculture farming. Schmidt and Seamans (2013) have found such activity as hazardous for airport activity according to ICAO regulations. This research re-emphasizes the statement of the DTP State of the Environment Report that the more construction takes place at the airport, the more likely it is to become more attractive to birds (DTPC, 2011).

## 6. 3. The Dube AgriZone Operation

### 6. 3. 1. Farmwise Marketing (Pty.) Ltd.

This study found that Farmwise was satisfied with their tenancy at the Dube AgriZone. The agricultural platform was beneficial toward the company decreasing their transportation and electrical costs. The new facility contained equipment for Farmwise to ripen their own bananas and to provide cut-vegetable products as an added service to the consumer.

Woolworths were influential in the Pack-house and Distribution Centre design and in Farmwise occupying the premises which indicates that the retailer‟s recommendation was integral in securing the tenancy. Farmwise did not actively pursue the Dube AgriZone until approached by Woolworths.

Surprisingly, although Farmwise expressed their intentions to branch into farming-activity, the company stated it would not pursue agriculture at the Dube AgriZone due to perceived climate issues on the coast (even within a climate-controlled facility), increased expenses, and likelihood of risk (with predictions that crops yields decrease by 30% at the coast). This shows that Farmwise is in fact wise about farming, and that they do not consider the Dube AgriZone as a suitable farming site.

Although Farmwise have been able to run their operation successfully at the Dube AgriZone, Farmwise is a packaging and distribution company– not farmers. The business is reliant upon produce grown from outside of the Dube AgriZone and does not process any produce grown at the Dube AgriZone: each of the farming tenants have their own pack-houses and do not rely on Farmwise‟s services. The „clustering‟ of Farmwise‟s facility within the Dube AgriZone lacks the element of providing a related service to the Dube AgriZone farming tenants. Farmwise‟s operational relationship with the other Dube AgriZone tenants could, therefore, be described as non-collaborative.

6. 3. 2. Qutom Farms (Pty.) Ltd.

Qutom has experienced some difficulty in operating from the Dube AgriZone. The site was useful in decreasing the company‟s transportation costs and regionalizing their supply to the KZN market. Much like Farmwise, Woolworths was influential in Qutom occupying the Dube AgriZone premises, suggesting that the food retailer perceived the benefits the agricultural facility could offer them, but needed to be proactive in order to secure it.

This research found that Qutom now only produces cucumbers and herbs and had stopped producing tomatoes and peppers due to the effects of the regional climate upon its crops. Apparently, Qutom‟s greenhouses are not capable of being cooled efficiently. However, this study found out from the company involved in the greenhouse cooling technologies that it was provided, but the farmer does not use it. Qutom averred that the issue was with the costs involved to operate the mechanisms which they have not been able to operate efficiently. This technological difficulty should not be overlooked because it has been costly for Qutom who have had to cease tomato and pepper production. The tenant‟s experience shows that the Dube

AgriZone facilities have an ineffective climate-controlling capability despite the Dube AgriZone being advertised as Africa‟s largest climate-controlled cultivation area. In addition, the discontinuation of tomato and pepper production has influenced the Food for Recyclables Programme to be postponed. The technological inefficiency has thus compromised the integrity of DTPC‟s CSI‟s.

Qutom‟s operation had been infected with pests as evident from the Koppert sachets in the greenhouses. Germer *et al*. (2011) did warn in their paper that CEA operations could still be compromised by the presence of pests as was the case with Qutom.

It was difficult for this study to discern whether Qutom‟s produce was flooding the KZN market or not, mainly due to the inconsistency and lack of access to complete evidence. The local farmers believed that the Dube AgriZone is a State-subsidized venture that competes unfairly with the local farmers. However, a KPMG study commissioned by DTPC suggested otherwise. The Dube AgriZone Executive added during an interview that they were being used as a scapegoat for bad market conditions. This study attempted to contact Kwanalu for their input, however, the union declined to participate. The impact of Qutom‟s produce on the KZN market has yielded conflicting information and because all sides to the story could not be obtained, the impact on the KZN market remains unclear.

This research suggests that all interested and affected KZN farmers be given the opportunity to air their farming grievances at an organised workshop or forum. The main objective of the Dube AgriZone is to stimulate the growth of KZN‟s perishable goods sector. *The Mercury* newspaper article revealed a group of KZN farmers struggling to stimulate their perishable goods sector, supposedly due to the Dube AgriZone‟s performance. This research questions why DTPC could not assist these struggling KZN farmers in accordance with the very purpose of the Dube AgriZone through its main objective. Assistance could have been provided to these farmers; instead, efforts were made toward the commissioning of a KPMG study to prove a point and ensure Dube AgriZone‟s detachment from adverse accusations.

6. 3. 3. Carmel Nurseries [c. c.]

Carmel was the first and only Dube AgriZone tenant able to secure an export contract. This study found that Carmel was also the first and only Dube AgriZone tenant to have left the agricultural facility and ended up in a court battle with DTPC.

LIV Flowers was initially meant to occupy Greenhouse D at the Dube AgriZone. The company informed DTPC that the South African market could not absorb an extra 4 ha of flowers and therefore, an international client would need to be secured. DTPC promised to secure an international client for LIV Flowers and did not deliver on this pledge. This highlights an unfortunate degree of unprofessionalism in empty promises and raises questions about the *modus operandi* of DTPC.

Although Carmel was eventually secured as a tenant, the conversion of Greenhouse D to ensure the production of Thai Tulips came at a huge public expense of 1,6-million Euros. This expenditure could have been avoided had the design of the greenhouse occurred after the Dube AgriZone had secured the tenant‟s contract. Germer *et al*. (2011) suggested that the selection of suitable plant varieties and the development of an appropriate growing environment in CEA must occur in tandem. If this had been done, then the cost could have been avoided. Since Carmel‟s tenancy did not last, the conversion of Greenhouse D now appears to be wasteful expenditure.

It was evident that Carmel experienced multiple issues during their tenancy. In terms of logistics, Emirates Airlines failed Carmel in mishandling their product. Although Kasarda (2006b) suggests that air transportation within an aerotropolis is advantageous to businesses because of the rapid efficient access to global suppliers and consumers, in Carmel‟s case air transportation proved unreliable and disadvantageous to their business. Carmel revealed that their greenhouse lacked effective cooling capabilities which resonated with Qutom‟s case. The mechanisms installed to ensure the greenhouses could be cooled suppressed air flow and caused damage to Carmel‟s produce (evident from the atmospheric soot from surrounding sugarcane burning which entered through the greenhouse vents and stained the flowers black). This reaffirms that although the Dube AgriZone claims to be climate-controlled farming, the facilities have proved ineffective for farming tenants. Carmel‟s greenhouse did not have a solar panel which compounded their electrical costs, putting them at a disadvantage compared to the other Dube AgriZone tenants

whose facilities had solar panels. Astonishingly, it was more expensive for Carmel to purchase their flower plantlets next door from Dube AgriLab than from KP Holland overseas. The fact that Dube AgriLab‟s plantlets would die two to three weeks later, casts doubt on the quality of the plantlets.

After Carmel‟s deal with KP Holland ended, and they attempted to sell to the local market, it surfaced that the Dube AgriZone had an associated stigma from the horticultural industry, similar to the stigma to that which local farmers have associated with Qutom‟s fresh produce coming from the Dube AgriZone. Plantimex have made their case known that they refuse to procure produce from the Dube AgriZone because it is subsidized by the State and competes with the local industry unfairly. If it is true that Plantimex had agreed to a non-procurement clause with DTPC, and DTPC did not inform Carmel about it prior to their tenancy, then this would have been unfair toward Carmel. The DTPC CEO did not agree to participate in this study and, therefore, this claim could not be confirmed. If true, perhaps DTPC did not perceive it as a threat because Carmel had secured a R10,6-million annual export contract with KP Holland. However, farming involves risks, and Carmel could have potentially avoided falling victim to this very risk had they been informed so a suitable alternative plan could be arranged.

This study has shown that of all the tenants, Carmel endured the worst experience of operating at the Dube AgriZone. Indeed, the business closed down. Carmel‟s staff members had to be retrenched as a result. In addition to DTPC‟s worker empowerment scheme that has faded, this research is concerned for the socio-economic security of Dube AgriZone employees. Overall, Carmel believed the Dube AgriZone did the business a disservice, although the company had not wanted to expose its experience to the media.

### 6. 4. Researching the Dube AgriZone

This study found that the Dube AgriZone‟s intentions were perceived as good and noble by all its tenants (including LIV Flowers). However, Farmwise did not perceive the Dube AgriZone to be suitable for farming, Qutom wished that they were involved in the project from the start, Carmel believed that DTPC did not have any relevant expertise in farming, and LIV Flowers found that the project was being administered by politicians and not industry experts. Woolworths procures

most of the produce being grown and processed at the Dube AgriZone, and although they have invested in the agricultural platform for the company‟s benefit, Woolworths does not envision the Dube AgriZone to solve the country‟s food insecurity issues as interpreted by The President. The company believes that investor confidence in South Africa‟s food sector has decreased due to issues of crime, corruption, policy and labour unrest. This is particularly detrimental to the Dube AgriZone that relies on investment to operate the farming facility.

During this study, Qutom raised some important issues related to the Dube AgriZone‟s model. As a farming company, Qutom believed that it is difficult for South African farmers to export to Europe and the Middle East because the window of export opportunity closed to a large degree when farming expanded in the Mediterranean regions. This would suggest that it might not be in the best interests of DTPC to aim at exporting its Dube AgriZone produce. Since CEA can be developed anywhere in the world (Despommier, 2013), regions can become self-sufficient in food production and decrease their reliance upon other countries for food. According to Qutom, the EU is such an example.

Qutom also noted that the local KZN farmers were offered the opportunity to farm at the Dube AgriZone, but no one accepted. It was difficult to investigate Qutom‟s claim and the reasons behind it from Kwanalu because the Union declined to participate in this study. However, the reality is that all Phase 1 tenants were not from KZN, but from Gauteng.

This research strongly encourages further debate and discussion about the viability of the Dube AgriZone because the progression of the agricultural facility to its second phase has been based on the „successful operation‟ of the existing phase (SiVEST, 2013c). This study has uncovered some operational success, however, there were also some concerning instances of failure during Phase 1.

## CHAPTER 7: Conclusion

This thesis was a case study of the Dube AgriZone at the Dube TradePort as per the researcher‟s interpretation and was concerned about the nature of the agricultural establishment and that of its operational performance. This study took place against the background of an emergent worldwide phenomenon of airports as the 21st century drivers of business locale and urban development. Minimal regard has been paid toward aerotropoli as hubs for agricultural activity; however, the study of the Dube AgriZone could offer an interesting contribution. This research relied on interviews, document analysis and digital recording of observations from site visits.

The Dube AgriZone is an ambitious agricultural project of the Dube TradePort Corporation. Its vision and intentions are clear and are calculated according to the outcomes of various scoping, specialist and evaluative studies. The project is a non-aeronautical component of an airport precinct and is generously and publically funded by the KwaZulu-Natal Department of Economic Development and Tourism.

Dube AgriZone has encountered some degree of success but has also failed in some respects. Although it boasts that it is a climate-controlled farming facility and largest of its kind in Africa, its farming tenants found the facilities to be ineffectively climate-controlled. The President of the Republic believed it to be a progressive step in agriculture and food security; however, the major food retailer who invested in the project and procured its produce believes otherwise.

It is evident that out of the Dube AgriZone‟s Phase 1 tenants, each has had a completely different experience and outlook on the agricultural venture. A fresh produce value-adding company had a successful operation processing non-Dube AgriZone grown produce, but the company would not invest in farming activity at the Dube AgriZone.

A hydroponics farming company was able to regionalize their fresh produce supply to the KZN market; however, they have ceased to grow two out of the three fresh produce items as originally intended because of infrastructural and climate issues within the Dube AgriZone greenhouses. The company continues to grow cucumbers despite their pest problem and perceived stigma of flooding the KZN fresh produce markets. The future of their Dube AgriZone operation and progression to Phase 2 remains uncertain.

A horticultural company was the first Dube AgriZone tenant to secure an export contract, but ended up being the first tenant to cease their Dube AgriZone operation and enter into a court battle with DTPC. The company experienced multiple infrastructural, financial, logistics and market issues. As a result of the combined issues, the company has had to shut down its financially exhausted business after efforts to save their Dube AgriZone operation were unsuccessful.

The Dube AgriZone is soon to implement Phase 2 for future operators and farmers. Conversely, an uncertain future lies ahead of the Airport Farmers Association soon to be evicted from their farmland under the Durban Dig-Out Port project expected to contribute enormously to the function of Aerotropolis:KZN.

This study has given the aerotropoli agriculture farmers and former airport-based farmers an opportunity to raise their concerns about farming near airports in this region of the world. This study suggests that DTPC maintain its ambition for the Dube AgriZone project and invite the input and advice of farmers. It should also support, preserve and maintain the valuable skills of farmers like those of AFA, before such talent and experience become redundant as farmers lose their land and livelihoods. DTPC needs to ameliorate their approach to administering an agricultural facility near an airport before it loses anymore tenants, influences the closure of anymore agricultural companies, and worsens its stigma amongst local KZN vegetable farmers and horticultural produce procurement agencies.

This study suggests that the Dube AgriZone contains immense potential to set the precedent for future aerotropoli agriculture platforms. However, DTPC needs to seriously consider the outcomes of Phase 1, especially the fact that the local fresh produce industry feels that the venture is unfairly subsidized by the State and some of the locals have refused to procure from the Dube AgriZone as a result. The international export venture was unsuccessful and the international client ceased procurement from the Dube AgriZone as well. Struggling to sell to both local and international markets is a severe concern for the Dube AgriZone and its future viability. This study advocates more research on aerotropoli agriculture and the Dube AgriZone, especially on how to ameliorate the current project‟s operational performance combating the issues that surfaced throughout this study in order to ensure a suitable and sustainable agricultural facility for the future.

It may be argued that this research is a premature assessment and critique of the Dube AgriZone since it is within its infancy stages. However, this does not make it less credible as a case study and it should not be disregarded. The Dube AgriZone is the reality of aerotropoli agriculture. It took a visit to the Dube AgriZone to inspire this research, which has enlightened the researcher on the state of the farming facility"s operational performance. It is hoped that this research will do the same for others.

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# REFERENCES


ACSA. n.d. *History*. Available: http://www.acsa.co.za/home.asp?pid=67 [2014, May 14].

ACSA. 2010. Latest News: King Shaka International Airport. 17 February. Available: http://www.acsa.co.za/home.asp?pid=94&toolid=2&ItemID=6491 [2014, May 16].

ACSA-DTP. n.d. *Lessons on Inter-governmental and SoE Collaboration from the development of the King Shaka International Airport and the Durban International Airport.* Available: http://www.thepresidency.gov.za/electronicreport/downloads/volume_4/strategic_management_operational_effectiveness/KSIA_Case_Study_Final_Version.doc [2014, May 14].

ACSA-DTP. 2008. *Dube TradePort KZN Growth and Investment Conference*. Available: http://www.natgrowth.co.za/ppt/DubeTradeportGrowthInvestmentConference.pdf [2014, June 12].

AECOM-McClier. 2002. *The Dube TradePort and The King Shaka International Airport: Project Overview and Feasibility Analysis*. Available: http://www.dubetradeport.co.za/SiteFiles/434/DubeTradePort-Pre-FeasibilityStudy-AECOM-McClier-2 [2014, May 6].

AFA. n.d. Airport Farmers: Old Durban International Airport Land, South Durban [Presentation].

Africa‟s trade gateway: That‟s the plan for the Dube TradePort at La Mercy. 2004. *Finance Week*. 23 June. Available: http://search.ebscohost.com/login.aspx?direct=true&db=buh&AN=13913391&site=ehost-live [2014, June 9].

Airports: The right stuff. 1994. *The Financial Mail*. 2 December. Available: http://reference.sabinet.co.za/document/SAM4219942920 [2014, May 15].

Airport is Natal‟s ‟95 priority. 1994. *The Natal Witness*. 24 November. Available: http://reference.sabinet.co.za/document/SAM4219942726 [2014, May 15].

Andrews, G. W. 2010. One strike and you‟re out. *Air Traffic Technology International*. Available: http://www.detect-inc.com/DeTect%20-%20ABAR/Article%20-%20One%20Strike%20and%20You're%20Out%20-%20Air%20Traffic%20Intl,%20-%20Gary%20Andrews%200908.pdf [2014, June 10].

Appold, S. J. & Kasarda, J. D. 2011. Seeding growth at airports and airport cities: Insights from the two-sided market literature. *Research in Transportation Business Management*. 1(1):91-100. DOI: 10.1016/j.rtbm.2011.06.011

Bigala, L. 2011. Dube TradePort development project, South Africa. *Engineering News*. 9 December. Available: http://www.engineeringnews.co.za/print-version/dube-tradeport-development-project-south-africa-2011-06-10 [2014, June 18].

Binswanger, H. P. & Townsend, R. F. 2000. The Growth Performance of Agriculture in Subsaharan Africa. *American Journal of Agricultural Economics*. 82(5):1075-1086. Available: http://www.jstor.org/stable/1244235 [2014, April 9].

Blackwell, B. F., DeVault, T. L., Fernández-Juricic, E. & Dolbeer, R. A. 2009. Wildlife collisions with aircraft: A missing component of land-use planning for airports. *Landscape and Urban Planning*. 93(1):1-9. DOI:10.1016/j.landurbplan.2009.07.005

Borowiec, J. D. & Dresser, G. B. 2000. *Evaluation of the Role and Needs of Agricultural Airports in Texas*. (Report; no. TX-99/1951-S). Austin, Texas: Texas Transportation Institute. Available: http://d2dtl5nnlpfr0r.cloudfront.net/tti.tamu.edu/documents/1951-S.pdf [2014, April 3].

Bourne Jr., J. K. 2009. The Global Food Crisis: The End of Plenty. *National Geographic Magazine*. May. Available: http://www.lccword.com/wau/file.php/1/Current_Events/Global_Food_Crisis_-_June_2009.pdf [2014, April 8].

Bryan, D. L. & O‟Kelly, M. E. 1999. Hub-and-Spoke Networks in Air Transportation: An Analytical Review. *Journal of Regional Science*. 39(2):275-295.

Bryant, A. & Charmaz, K. Eds. 2007. *The SAGE Handbook of Grounded Theory*. London: SAGE Publications Ltd. Available: http://dx.doi.org.ezproxy.uct.ac.za/10.4135/978188607941 [2014, March 17].

Calls to use La Mercy site for housing: Estimated R10-m „wasted on airport. 1989. *The Star*. 25 October. Available: http://reference.sabinet.co.za/document/SAM4219893156 [2014, May 14].

Campbell, C. 1993. La Mercy set for take off: Plan to trim Louis Botha, trim Virginia. *The Natal Mercury*. 29 January. Available: http://reference.sabinet.co.za/document/SAM421993173 [2014, May 14].

Certhon & Dube AgriZone. 2012. Completion Report: Greenhouse Construction.

Challinor, A., Wheeler, T., Garforth, C., Craufurd, P. & Kassam, A. 2007. Assessing the vulnerability of food crop systems in Africa to climate change. *Climatic Change*. 83(3):381-399. DOI: 10.1007/s10584-007-9249-0

Charles, M. B., Barnes, P., Ryan. N. & Clayton, J. 2007. Airport Futures: Towards a critique of the aerotropolis model. *Futures.* 39(9):1009-1028. DOI: 10.1016/j.futures.2007.03.017

Clover, J. 2003. Food Security in Sub-Saharan Africa. *African Security Review*. 12(1):5-15. DOI: 10.1080/10246029.2003.9627566

CN. 2013a. RE: Lease Agreement Between Carmel Nurseries and DTPC. 17 December. [Letter to the Dube TradePort Corporation].

CN. 2013b. RE: Lease Agreement Between Carmel Nurseries and DTPC. 18 December. [Letter to the Dube TradePort Corporation].

Coan, S. 2013. Proposed Durban dig-out port could threaten the livelihoods of „airport farmers". *The Witness*. 15 November. Available: http://www.sdcea.co.za/images/stories/newsarticles/DigOutPort/thewitness_151113.pdf [2014, June 11].

Cohen, B. 2005. Urbanization in developing countries: Current trends, future projections, and key challenges for sustainability. *Technology in Society*. 28(1):63-80. DOI: 10.1016/j.techsoc.2005.10.005

Cole, B. 2008. Airports and birds can share air. *The Daily News*. 10 April. Available: http://www.dubetradeport.co.za/SiteFiles/360/DailyNews10Apr08AirportandbirdscanshareairbyBarbar [2014, June 11].

Corcoran, B. 2010. New airport exceeding expectations in South Africa. *International News Services.com*. Available: http://go.galegroup.com/ps/i.do? [2014, May 15].

Cotula, L. & Vermeulen, S. 2009. Deal or no deal: the outlook for agricultural land investment in Africa. *International Affairs*. 85(6):1233-1247. Available: http://www.chathamhouse.org/sites/files/chathamhouse/public/International%20Affairs/2009/85_6cotula_vermeulen.pdf [2014, April 9].

de Janvry, A. & Sadoulet, E. 2010. Agriculture for Development in Africa: Business-as-Usual or New Departures? *Journal of African Economies*. 19(S2):ii7-ii39. DOI: 10.1093/jae/ejp028

De Schutter, O. 2011. How to not think of land-grabbing: three critiques of large-scale investments in farmland. *The Journal of Peasant Studies*. 38(2):249-279. DOI: 10.1080/03066150.2011.559008

Despommier, D. 2011. The vertical farm: controlled environment agriculture carried out in tall buildings would create greater food security for large urban populations. *Journal of Consumer Protection and Food Security*. 6(2):233-236. DOI: 10.1007/s00003-010-0654-3

Despommier, D. 2013. Farming up in the city: the rise of urban vertical farms. *Trends in Biotechnology*. 31(7):388-389. DOI: 10.1016/j.tibtech.2013.03.008

Devan, Y. 1991. Tongaat wants La Mercy airport site. *Sunday Tribune*. 3 March. Available: http://reference.sabinet.co.za/document/SAM421991295 [2014, May 13].

DeVault, T. L., Begier, M. J., Belant, J. L., Blackwell, B. F., Dolbeer, R. A., Martin, J. A., Seamans, T. W. & Washburn, B. E. 2013. Rethinking airport land-cover paradigms: agriculture, grass, and wildlife hazards. *Human-Wildlife Interactions*. 7(1):10-15. Available: http://www.wildlifeconflicts.org/journal/spring2013/%2013-107%20DeVault%20Comment%20FINAL.pdf [2014, April 3].

Dhlamini, B. 2013. *AgriZone-controlled efficiency*. Available: http://www.frigairexpo.co.za/index.php?option=com_content&view=article&id=4557:agrizone--controlled-efficiency&catid=228:plumbing-projects&Itemid=322 [2014, June 18].

Dispute ends. 2006. *International Construction*. 45(3):7.

dti. 2014. Application for IDZ Designation and Operator Permit for the Dube TradePort Industrial Development Zone. 2014. *Government Gazette*. No. 37610. 5 May. Government Notice no. 336 of 2014. Pretoria.

DTP. 2010. *Dube TradePort Company Strategic Plan 2009/10 to 2013/14*. Available: http://www.dubetradeport.co.za/SiteFiles/440/StrategicPlanFINAL.pdf [2014, May 15].

DTP. 2011. *Dube AgriZone: FUTURE FARMING*. Available: http://www.youtube.com/watch?v=OaAouEFMPrA [2014, May 5].

DTP. 2012. Dube TradePort AgriZone Launch. Available: http://www.youtube.com/watch?v=Y3-Bbi5HIWA [2014, May 8].

DTP. 2013a. *Dube TradePort Flower Export*. Available: http://www.youtube.com/watch?v=O-QVdskFuuE [2014, May 7].

DTP. 2013b. *Dube TradePort: A World of Opportunity 2013*. Available: http://www.youtube.com/watch?v=OcGkv89OZFI [2014, May 5].

DTP. 2014a. *Overview– Dube AgriZone*. Available: http://agrizone.dubetradeport.co.za/Pages/Home [2014, May 5].

DTP. 2014b. *Dube TradePort… Southern Africa's premier air logistics platform*. Available: http://www.dubetradeport.co.za/ [2014, May 7].

DTP. 2014c. *History*. Available: http://www.dubetradeport.co.za/Pages/Company-Profile/History [2014, May 7].

DTP. 2014d. *Aerotropolis*. http://www.dubetradeport.co.za/Pages/DTP%20Precinct/Aerotropolis [2014, May 8].

DTP. 2014e. *Geared for Growth: Designated SEZ*. Available: http://www.dubetradeport.co.za/SiteFiles/865/Dube%20TradePort%20-%20Property%20Brochure%202014%20(web).pdf [2014, May 13].

DTP. 2014f. *Vision*. Available: http://www.dubetradeport.co.za/Pages/Company-Profile/Vision [2014, May 12].

DTP. 2014g. Dube AgriLab to Export Sugarcane Plantlets to Nigeria. *Dube Times*. 10 March. Available: http://www.dubetradeport.co.za/News/5/Dube-Times-Newsletter/85/DubeTimes-March2014 [2014, June 20].

DTPC. 2010. *Annual Performance Plan 2010/ 2011*. KZN.

DTPC. 2011. *Dube TradePort State of the Environment Report*. Available: http://agrizone.dubetradeport.co.za/SiteFiles/455/DTPCStateoftheEnvironmentReport2011-12.pdf [2014, June 10].

DTPC. 2012. *Annual Performance Plan 2012/2013*. KZN.

DTPC. 2013a. *Dube TradePort Overview: The Opportunities in the North*. International Convention Centre, Durban: Infrastructure Launch Presentation. Available: http://www.ilembechamber.co.za/sites/default/files/DTPC%20Presentation%202013%20ICC.pdf%20-%20Infrastructure%20Lunch.pdf [2014, May 12].

DTPC. 2013b. *Dube TradePort: Comments on Efficacy of Current EIA Legislation*. Available: http://db3sqepoi5n3s.cloudfront.net/files/130731dubetradeport.pdf [2014, May 13].

DTPC. 2014a. Graphics. Dube TradePort Corporation Marketing and Advertising Division.

DTPC. 2014b. *Annual Report Card 2013/ 2014*. KZN.

DTPC. 2014c. *Invitation for Call for Proposals from Prospective Operators for the Leasing and Operation of Two Separate Greenhouse & Packhouse Facilities at the AgriZone, Dube TradePort, (Home of King Shaka International Airport), La Mercy Kwa- Zulu Natal*. REF: DTP/CFP/04/AZ/04/2014. 9 May. Available: http://www.dubetradeport.co.za/SiteFiles/822/ADVERTAgriZoneGreenhouseFacilitiesCFP04AZ042014.pdf [2014, May 8].

Dube AgriZone. 2013. Overview: Call for Proposal– Dube AgriZone Phase 2.

Dube Dreamscapes. 2011. *Business in Durban*. Available: http://www.dubetradeport.co.za/SiteFiles/375/BusinessinDurbanonDubeTradePort.pdf [2014, May 6].

eNCA. 2013. *Durban Greenhouse Grows Thousands of Tulips*. Available: https://www.youtube.com/watch?v=urc6jhIamfw [2014, June 20].

Freestone, R. 2009. Planning, Sustainability and Airport-Led Development. *International Planning Studies.* 14(2):161-176. DOI: 10.1080/13563470903021217

FMN. 2012. How airport cities can boost economic growth in Africa. Available: http://info.frontiermarketnetwork.com/hs-fs/hub/235203/file-385254100-pdf/PDFs/How_airport_cities_can_greatly_grow_Africas_economy.pdf [2014, April 1].

Gedye, L. 2012. Durban port expansion: Communities face harbour „creep". *Mail and Guardian*. 4 October. Available: http://reference.sabinet.co.za/document/SAM4220124496 [2014, June 11].

Germer, J., Sauerborn, J., Asch, F., de Boer, J., Schreiber, J., Weber, G. & Müller, J. 2011. Skyfarming an ecological innovation to enhance global food security. *Journal for Consumer Protection and Consumer Safety*. 6(2):237-251. DOI: 10.1007/s00003-011-0691-6

Gillen, D. 2011. The evolution of airport ownership and governance. *Journal of Air Transport Management*. 17(1):3-13. DOI: 10.1016/j.jairtraman.2010.10.003

Hanekom, E. 2013. Marchers protest airport farmers‟ forced relocation. *Southlands Sun*. 24 November. Available: http://southlandssun.co.za/19773/marchers-protest-airport-famers-forced-relocation/ [2014, June 17].

Harrilall, K. 2012. Zuma launches KZN‟s trade gateway to the world. *The Witness*. 9 March. Available: http://www.dubetradeport.co.za/SiteFiles/385/15693440.pdf [2014, May 16].

ISHGI. 2009. *Dube TradePort Evaluation System: A socio-economic impact approach*. La Mercy, KwaZulu-Natal: Final Report.

Jansen, J., Naidoo, S. & Broughton, T. 2012. Dube TradePort boss quits. *The Mercury*. 11 April. Available: http://www.iol.co.za/mercury/dube-tradeport-boss-quits-1.1360351#.U__JrcX7K24 [2014, June 10].

Jansen van Vuuren, R. R. 2011. The hangover is over: editor‟s comment. *Institution of Municipal Engineers of Southern Africa*. 36(7):5.

Joubert, R. 2011. Planting underway at Durban‟s AgriZone. *Farmers Weekly*. 6 May. Available: http://reference.sabinet.co.za/document/SAM1920113608 [2014, June 20].

Joubert, R. 2013a. Greenhouse farming at Dube TradePort AgriZone. *Farmers Weekly*. 27 March. Available: http://www.farmersweekly.co.za/article.aspx?id=37342&h=Greenhouse-farming-at-Dube-Tradeport-AgriZone [2014, June 13].

Joubert, R. 2013b. Multi-billion rand dig-out port to displace small-scale farmers. *Farmers Weekly*. 25 November. Available: http://www.farmersweekly.co.za/news.aspx?id=47893&h=Multi-billionranddig-outporttodisplacesmall-scalefarmers [2014, June 13].

Kasarda, J. D. n.d. *About the Aerotropolis*. Available: http://www.aerotropolis.com/airportCities/about-the-aerotropolis [2014, April 1].

Kasarda, J. D. 2001. Logistics and the Rise of the Aerotropolis. *Real Estate Issues*. 25(4):43-48. Available: http://www.questia.com/magazine/1G1-71837302/logistics-the-rise-of-aerotropolis [2014, March 31].

Kasarda, J. D. 2006a. The Rise of the Aerotropolis. *The Next American City*. 10(10):35-37. Available: http://www.semcog.org/uploadedFiles/Programs_and_Projects/Regional_Growth/Development/Aerotropolis/NextAmericanCity.pdf [2014, March 31].

Kasarda, J. D. 2006b. Airport Cities and the Aerotropolis: The Way Forward. In *Global Airport Cities*. J. D. Kasarda, Ed. London: Insight Media. 1-31.

Kasarda, J. D. 2008. Shopping in the Airport City and Aerotropolis. *Research Review*. 15(2):50-56. Available: http://m.aerotropolis.com/files/2008_ResearchReview_Aerotropolis.pdf [2014, March 31].

Kasarda, J. D. 2011. The Aerotropolis and Global Competitiveness. *Diplomatic Courier*. 5(5):16-19. Available: http://www.aerotropolis.com/files/aerotropolis_global_competitiveness.pdf [2014, March 31].

Kasarda, J. D. & Lindsay, G. 2011. The Cool Chain. In *Aerotropolis: The Way We"ll Live Next*. J. D. Kasarda & G. Lindsay, Eds. England: Penguin Books. 209-241.

Khanyile, S. 2009. *Tongaat Hulett heads for land clash with state*. Available: http://www.dubetradeport.co.za/SiteFiles/332/BusinessReport-02June2009.pdf [2014, June 9].

Koppert. n.d. *The Company*. Available: http://www.koppert.com/company/ [2014, June 19].

KP Holland, n. d. *About KP Holland*. Available: http://www.kpholland.nl/en [2014, May 7].

KPMG. 2012. Dube TradePort Corporation: The microeconomic impact of Dube AgriZone.

KPMG. 2013. Dube TradePort Corporation: Macroeconomic Impact Study of the Dube AgriZone.

Kratzsch, U. & Sieg, G. 2011. Non-aviation revenues and their implications for airport regulation. *Transportation Research Part E: Logistics and Transportation Review*. 47(5):755-763. DOI: 10.1016/j.tre.2011.02.010

KSEMS. 2010. Draft Rehabilitation Plan, Dube TradePort AgriZone. Draft 2.

KwaZulu-Natal Dube TradePort Corporation Act, No. 2 of 2010. *Extraordinary Provincial Gazette of KwaZulu-Natal*. No. 10507. 21 October. Government notice no. 4. KZN: Government Printer.

La Mercy airport project proposal due for debate. 1994. *Business Day*. 24 November. Available: http://reference.sabinet.co.za/document/SAM4219942799 [2014, May 15].

Layder, D. Ed. 1998. *Sociological Practice*. London: SAGE Publications Ltd. Available: http://dx.doi.org.ezproxy.uct.ac.za/10.4135/9781849209946 [2014, March 17].

Lemon, A. 1990. The political position of Indians in Durban. In *South Asians Overseas: Migration and Ethnicity*. C. G. Clarke, C. Peach & S. Vertovec, Eds. Cambridge University Press. 131-163.

Lindsay, G. 2006. Age of the Aerotropolis: Huge airports with thriving cities nearby, are rising everywhere– evoking everything we fear about globalization. *Fast Company*. (107):76-85. Available: http://search.ebscohost.com/login.aspx?direct=true&db=buh&AN=21412411&site=ehost-live [2014, April 1].

MacGregor, J. & Vorley, B. 2006. Fair Miles? The concept of "food miles" through a sustainable development lens. *International Institute for Environment and Development*. Available: http://pubs.iied.org/pdfs/11064IIED.pdf [2014, April 9].

McKechnie, L. 2008. *„Observational Research"* in L. M. Given. Ed. California: SAGE Publications Inc. Available: http://dx.doi.org.ezproxy.uct.ac.za/10.4135/9781412963909.n295 [2014, March 17].

Mkhize, N. 2014. Transnet meets resistance in drilling for Durban dig-out port. *Business Day Live*. 5 March. Available: http://www.bdlive.co.za/business/transport/2014/03/05/transnet-meets-resistance-in-drilling-for-durban-dig-out-port [2014, June 13].

Moolla, Z. & Paruk, F. 2009. Forced removals yet again. *South African Labour Bulletin*. 33(1):33-34.

Morrison, W. G. 2009. Real estate, factory outlets and bricks: A note on non-aeronautical activities at commercial airports. *Journal of Air Transport Management*. 15(3):112-115. DOI: 10.1016/j.jairtraman.2008.11.005

Motau, D. 2011. First Dube TradePort AgriZone greenhouse complete. *Engineering News*. 3 June. Available: http://www.engineeringnews.co.za/article/first-dube-tradeport-agrizone-greenhouse-block-complete-2011-06-03 [2014, June 17].

Mount Moreland Conservancy. n. d. *ACSA King Shaka International Airport Bird Detection Radar System*. Available: http://www.mountmorelandconservancy.co.za/History/Barn-Swallow-Radar.html [2014, June 10].

Mount Moreland Inkonjane. n.d. Available: http://mountmoreland.com/Important-Bird-Area-IBA.html [2014, June 10].

Naidoo, S. 2008. Project will be ready for 2010, says officials: New airport development on track. The *Mercury*. 20 October. Available: http://www.dubetradeport.co.za/SiteFiles/346/Mercury20Oct08Newairportdevelopmentontrack.pdf [2014, May 15].

Naidoo, S. 2013. Dube TradePort sprouts two top deals. *The Mercury*. 23 January. Available: http://www.iol.co.za/mercury/dube-tradeport-sprouts-two-top-deals-1.1457379#.U808y5T7K24 [2014, June 20].

Naidoo, S. & Mkamba, L. 2012. AgriZone hurting farmers, workers. *The Mercury*. 23 April. Available: http://www.iol.co.za/mercury/agrizone-hurting-farmers-workers-1.1281254?ot=inmsa.ArticlePrintPageLayout.ot [2014, June 19].

Nevin, T. 2010. World Cup opening for Durban‟s King Shaka International airport. *African Business*. 365:39.

Nevin, T. 2012. Durban‟s big dig. *African Business*. 389:72.

*New Durban dug-out Port– tenders released*. 2012. [Blog, 19 April]. Available: http://mpoverello.com/2012/04/19/new-durban-dug-out-port-tenders-released/ [2014, June 17].

O‟Kelly, M. E. 1998. A geographer‟s analysis of hub-and-spoke networks. *Journal of Transport Geography*. 6(3):171-186. DOI: 10.1016/S0966-6923(98)00010-6

O‟Toole, S. 2011. Welcome to the age of the aerotropolis. *Mail and Guardian*. 23 December. Available: http://mg.co.za/article/2011-12-23-welcome-to-the-age-of-aerotropolis/ [2014, April 1].

Our Phantom Airport. 1985. *The Natal Mercury*. 8 March. Available: http://reference.sabinet.co.za/document/SAM421985547 [2014, May 14].

Payne, T. 2013. *Dube AgriZone streaks ahead*. Available: http://www.fbreporter.com/2013-04-11-09-53-40/packaging-reporter/26--sp-341/26641-dubeagrizone-streaks-ahead [2014, May 7].

Phillips, L. 2011. Dube TradePort: an export advantage for farmers. *Farmers Weekly*. 8 August. Available: http://www.farmersweekly.co.za/article.aspx?id=10219&h=Dube-TradePort:-An-export-advantage-for-farmers [2014, June 10].

Phuhlisani Solutions. 2012. *Dube TradePort Worker Empowerment Initiative*. Available: http://www.phuhlisani.com/view.asp?ItemID=94&tname=tblComponent1&oname=News&pg=front [2014, June 20].

Pillay, S. 2013. Port expansion roots out farmers. *Times LIVE*. 19 May. Available: http://www.timeslive.co.za/sundaytimes/Extra/2013/05/19/port-expansion-roots-out-farmers [2014, June 11].

Porter, M. E. 1998. Clusters and the New Economics of Competition. *Harvard Business Review*. 76(6):77-90. Available:http://www.rimisp.org/wp-content/uploads/2012/07/31_rimisp_Cardumen.pdf [2014, May 5].

Posthumus, C. 2011. Biggest in Africa– KZN‟s aerotropolis greenhouses take off. *SABI Magazine.* April/ May, 4(3):4-7.

Premdev, D. 2006. Farmers in „limbo‟ as they face eviction. *Tribune Herald* (Durban). 12 March.

Rajgopaul, J. 1983. Gardeners, Merebank: A market gardener and her assistant clearing land adjoining Louis Botha Airport. *University of Cape Town Libraries*. Available: http://uctscholar.uct.ac.za:1801/view/action/singleViewer.do?dvs=1406645668690~335&locale=en_US&VIEWER_URL=/view/action/singleViewer.do?&DELIVERY_RULE_ID=10&search_terms=durban%20airport&adjacency=N&application=DIGITOOL-3&frameId=1&usePid1=true&usePid2=true [2014, June 12].

Robbins, G., Scott, D. & Sutherland, C. 2011. Taking flight: The impact of the Dube TradePort/ King Shaka International Airport mega-project on city resource allocation decisions in Durban, South Africa. Available: http://eadi.org/gc2011/robbins-638.pdf [2014, May 16].

Robbins, G. 2014. The Dube TradePort– King Shaka International Airport mega-project: Exploring impacts in context of multi-scalar governance processes. *Habitat International*. 1-9. DOI: 10.1016/j.habitatint.2014.05.006

Ross, M. A. 1956. *The History of Aviation in Durban: An Interesting Record of the First Flights made in South Africa and the Birth of Aviation in the Sub-Continent*. Available: http://www.fad.co.za/Resources/aviation/DurbanAirHistory.txt [2014, May 13].

Ross, K. 1994. New airport proposal welcomed: City leaders back plan. *The Daily News*. 22 July. Available: http://reference.sabinet.co.za/document/SAM4219941437 [2014, May 14].

Schmidt, P. M. & Seamans, T. W. 2013. Wildlife Conservation and Alternative Land Uses at Airports. In *Wildlife in airport environments: preventing animal-aircraft collisions through science-based management*. J. A. Martin, T. J. Conkling, J. L. Belant, K. M. Biondi, B. F. Blackwell, T. L. DeVault, E. Fernández-Juricic, P. M. Schmidt & T. W. Seamans, Eds. Maryland, USA: John Hopkins University Press. 117-125.

SDCEA. 2006. RE: Plight of the Airport Farmers. 8 June. [Letter to the MEC for Agriculture and Environmental Affairs, Minister Ndabandaba].

SDCEA. 2008. *South Durban Community Spatial and Development vision*. Available: http://www.sdcea.co.za/images/stories/pdfs/south_durban_community_spatial_vision.pdf [2014, June 11].

SDCEA. 2009. *Climate Change and Poverty Hearing Final Report*. Available: http://www.pmg.org.za/docs/2009/091118sdcea.pdf [2014, June 12].

Self, W. 2011. *The Frowniest Spot on Earth. London Review of Books.* 33(9):10-11. Available: http://www.lrb.co.uk/v33/n09/will-self/the-frowniest-spot-on-earth [2014, April 1].

SESSA. 2011. Power Solutions and Solarworld Supply Africa‟s Largest Rooftop Installation at Dube TradePort. *SESSA News*. 22 November. Available: http://www.sessa.org.za/members-news-pv/item/power-solutions-and-solarworld-supply-africa-s-largest-rooftop-installation-at-dube-tradeport [2014, June 18].

Simons, H. Ed. 2009. *Case Study Research in Practice*. London: SAGE Publications Ltd. Available: http://dx.doi.org.ezproxy.uct.ac.za/10.4135/9781446268322 [2014, March 17].

SiVEST. 2013a. *Dube TradePort AgriZone Phase 2 Aerial View*. Available: http://www.sivest.co.za/DownloadHandler.ashx?File=E:/www/sivestcj/sivest.co.za/wwwroot/upl

oadedDocuments/11694%20-%20DTP%20Agrizone%202%20Final%20Scoping%20Report/Appendix%20B%20-%20site%20maps_site%20photos/11694%20-%20Aerial%20View.pdf [2014, June 19].

SiVEST. 2013b. Background Information Document (BID): Environmental Impact Assessment (EIA) for the proposed AgriZone 2 Expansion at Dube Tradeport, Tongaat, KwaZulu-Natal. DEA Reference No: 14/12/16/3/3/2/469.

SiVEST. 2013c. Dube TradePort Corporation: Proposed Development of AgriZone Phase 2, Tongaat. Draft Scoping Report. DEA Ref. No. 14/12/16/3/3/2/480.

Spickermann, A., Grienitz, V. & von der Gracht, H. A. 2013. Heading towards a multimodal city of the future? Multi-stakeholder scenarios for urban mobility. *Technological Forecasting and Social Change*. DOI: 10.1016/j.techfore.2013.08.036

Sterner, R. T., Elias, D. J., Garrison, M. V., Johns, B. E. & Kilburn, S. R. 1984. Birds and Airport Agriculture in the Conterminous United States: A review of literature. *Proceedings of the Wildlife Hazards to Aircraft Conference and Training Workshop*. 22-25 May 1984. South Carolina: PEER Consultants, Inc. 319-329. Available: http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=ADP004208 [2014, April 3].

Sumberg, J., Anyidoho, N. A., Leavy, J., te Lintelo, D. J. H. & Wellard, K. 2012. Introduction: The Young People and Agriculture „Problem" in Africa. *Institute of Development Studies (IDS) Bulletin*. 43(6):1-8. DOI: 10.1111/j.1759-5436.2012.00374.x

The Presidency. 2012. *Address by President J. G. Zuma at the launch of the Dube Trade Port in La Mercy, KZN*. La Mercy, 8 March 2012. Available: http://www.thepresidency.gov.za/pebble.asp?relid=5767 [2014, May 5].

Thurow, R. 2010. The Fertile Continent: Africa, Agriculture"s Final Frontier. *Foreign Affairs*. 89(6):102-110. Available: http://www.jstor.org/stable/20788721 [2014, April 8].

VCE. 2009. *Dube TradePort AgriZone: Master Plan*. (Final Report P7044).

VCE. 2010. *Dube TradePort– AgriZone: Construction Environmental Management Plan*. (Final Report P7044/ R698).

Wang, K. J., Hong, W. C., Chen, S. H. & Jiang, J. T. 2011. Strategic development trend and key factors analysis of Airport City in Taiwan. *Journal of Transport Geography*. 19(4):807-820. DOI: 10.1016/j.jtrangeo.2010.10.003

West, E. 2013. Dube TradePort lures investment. *Business Day Live*. 25 January. Available: http://www.bdlive.co.za/business/trade/2013/01/25/dube-tradeport-lures-investment [2014, June 20].

Wittwer, S. H. & Castilla, N. 1995. Protected Cultivation of Horticultural Crops Worldwide. *HortTechnology*. 5(1)-6-23. Available: http://horttech.ashspublications.org/content/5/1/6.full.pdf [2014, April 10].

Young, R. 2011. King Shaka International Airport structural engineering and construction features. *Civil Engineering*. 19(2):25-32.

Ziegler, R. 2005. The Vertical Aeroponic Growing System. *Synergy International Inc*. Available: http://www.smartergardens.com/wp-content/uploads/2013/06/VAP.pdf [2014, April 10].

# APPENDIX

## Appendix 1: Dube AgriZone Proposal Call for Greenhouse A & D Tenants

**INVITATION FOR CALL FOR PROPOSALS FROM PROSPECTIVE OPERATORS FOR THE LEASING AND OPERATION OF TWO SEPARATE GREENHOUSE & PACKHOUSE FACILITIES AT THE AGRIZONE, DUBE TRADEPORT, (HOME OF KING SHAKA INTERNATIONAL AIRPORT), LA MERCY KWA ZULU NATAL**

**DUBE TRADEPORT CORPORATION (DTPC)**

REF: DTP/CFP/04/AZ/04/2014

Dube TradePort Corporation (DTPC) was created as a provincial public entity to develop Dube TradePort. Refer to www.dubetradeport.co.za for more information on DTPC.

Dube TradePort has constructed a number of greenhouses and packhouses for the production and packaging of horticultural crops. This is an invitation to two independent prospective operators to submit proposals for the operation of two separate four hectare glass greenhouse known as Block D and Block A.

In keeping with its approach of providing world class facilities and infrastructure, DTPC wishes to invite interested companies who may wish to lease the facility to submit proposals to DTPC. DTPC will evaluate all proposals within a set timeframe and successful companies will be invited to submit final proposals If the final proposal is accepted DTPC will then enter into further negotiations with the prospective lessee.

**REQUESTS FOR DOCUMENTS & ENQUIRIES**

All enquiries should be directed to Vanishree Naidoo via email tenders@dubetradeport.co.za

Call for Proposals documents will be available **from Monday, 12th May 2014** during weekdays (Mon – Fri) between 08h30 and 16h00, at the Dube TradePort Corporation offices at 7 Umsinsi Junction, 4th floor, 29° South, La Mercy, KwaZulu-Natal. A non-compulsory site inspection has been scheduled for the 22nd May 2014 at 14h00 for any interested parties.

**SUBMISSION OF PROPOSALS**

Expressions of interest together with proposals for use of the Greenhouse & Packhouse Facilities and a company profile must be submitted by hand at the **DTPC** offices. The proposals will be assessed on an ongoing basis but the first proposal evaluation will be for proposals submitted on or before the **6th June 2014.**

Documents should be clearly marked "**DTPC- CALL FOR PROPOSALS – GREENHOUSE & PACKHOUSE FACILITIES, DUBE AGRIZONE**"

*Source: DTPC, 2014c*